Courses and Curricula

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African American Studies
(Office of Letters and Science)

Department Office: 660 Barrows Hall, (510) 642-7084
african.berkeley.edu
Chair: Charles Henry, Ph.D.

Professors
Charles Henry (Chair), Ph.D. University of Chicago. Black politics, public policy
Perry Habibian, Ph.D. Yale University. Political sociology, social change
Michael P. Lazear, Ph.D. University of Illinois. Caribbean anthropology
William M. Banks (Emeritus), Ed.D.
Margaret B. Wilkinson (Emerita), Ph.D.

Associate Professors
Brandi Wilkins Cataneau, Ph.D. Stanford University. Drama and humanities (Dance, Theatre, Dance, and Performance Studies)
Sam A. Mchombo, Ph.D. University of London. Linguistics
Leila Chatfield, Ph.D. Yale University. African American studies and American studies
Darieck Scott, Ph.D. Stanford University. Modern thoughts and literature
Kim Strother, Ph.D. University of California, Berkeley. Sociology
Ula Taylor, Ph.D. University of California, Santa Barbara. American history

Assistant Professors
G. Ugo Nwokey, Ph.D. University of Toronto. African and African diaspora history, the Atlantic slave trade
Janelle T. Scott, Ph.D. University of California, Los Angeles. Educational policy

Adjunct Professor
Robert Allen (Graduate Adviser), Ph.D. University of California, San Francisco. Sociology

Affiliated Professors
Hardy Frye (Emeritus), Ph.D. University of California, Berkeley. Sociology
Jocelyne Guilbault, Ph.D. University of Michigan. Caribbean cultural studies, cultural studies (Music)
Waldo E. Martin Jr., Ph.D. University of California, Berkeley. African American, intellectual history
Abdul Jan Mohamed, Ph.D. Brandeis University. African American literature, postcolonial and world literature, critical theory
Tyler E. Stovall, Ph.D. University of Wisconsin, Madison. French history (History)

Miri-ha T. Trinh, Ph.D. University of Illinois. Feminist theory, film theory and production, comparative literary and art theory, cultural politics, Third World arts and politics

Overview of Curriculum
The Department of African American Studies offers students a bachelor of arts degree as well as a minor in African American studies. The curriculum focuses on Africa and the African diaspora, with particular attention paid to the life and culture of the populations of African descent in North America and the Caribbean. There is also some focus on populations of African descent in Latin America and the Caribbean. The program is interdisciplinary and prepares students to use and develop analytical approaches to critical issues associated with the African diaspora.

In preparation for declaring a major in African American studies, students should complete the Reading and Composition requirement and freshman/sophomore seminars. African American studies offers lower division courses that satisfy the American Cultures and College of Letters and Science Breadth requirements. For a list of current semester freshman/sophomore seminars and other courses with selected topics, consult the description of courses for the current semester available at the department office. Students must have at least 6 units and a GPA of 2.5 to declare.

Major Requirements
Completion of or enrollment in the following four courses is required in order to declare the major:
AAS 4A-4B, African: History and Culture; and
5A-5B, Black Life and Culture. Students are strongly encouraged to complete the lower division requirements early in their academic program. Upon declaring the major, students are required to complete the following upper division core requirements:

AAS 100—Introduction to African American Studies
AAS 101—Interdisciplinary Research Methods
AAS 116—Colonialism, Slavery, and African American Life Before 1865

To complete the major, students must take a cluster of eight to 10 courses (depending on thesis status) focused on a specific area of concentration. Such a concentration is expected to form the basis for a senior thesis. Five of the eight courses must be selected from Department of African American Studies course offerings. The remaining three courses may be taken from other departments. The list of areas of concentration and sample programs is available in the department office.

Honors Program. To be eligible for admission to the Honors Program, a student must have completed at least two semesters at Berkeley and have attained senior standing with a GPA of 3.5 or higher in all upper-division coursework, as well as a 3.5 GPA or higher in the African American studies major. Students in the program must complete two consecutive semesters of African American Studies H195A-H195B under the supervision of a faculty member, culminating in the completion of a senior honors thesis or equivalent project.

Minor Requirements
Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their major.
For the minor in African American studies, students must complete at least one lower division course selected from AAS 4A, 4B, 5A, or 5B and five upper division courses in the Department of African American Studies.

Consistent with Letters and Science requirements, a GPA of 2.0 is required in all courses applied to the minor program. All courses in the minor must be taken for a letter grade. Students may petition to have transfer credits accepted, but transfer students must take a minimum of three upper division courses from the Department of African American Studies.

Old Major Requirements
Program changes were effective beginning fall 1995. Students who declared the major before fall 1995 are not required to meet the new requirements. Their programs of study will be based on existing requirements. Students completing College of Letters and Science Breadth requirements under the six-course rule should consult with the department regarding the Breadth requirement.

Graduate Program
Students are admitted to graduate studies in the Spring semester. Applicants must have a University of California, Berkeley graduate application; two official transcripts from all colleges and universities attended; three letters of recommendation; writing sample (no more than 15 pages) that best reflects their program/research interests. TOEFL is required for all international students. Applications are accepted for the Ph.D. only.

The African American studies graduate program focuses on life, culture, and social organization (broadly defined) of persons of African descent. Africa, North America, and the Caribbean are central components of the program. Students are expected to apply a multidisciplinary approach to the study of the international divisions of race as they pertain to persons of African descent, wherever they may find themselves. Such an approach is to be employed for the study and understanding of development and underdevelopment, domination and power, self-determination, mutual cooperation, and aesthetic and creative expression. Issues of identity construction, marginality, territoriality, and the universal role of race within the organization of economic and in class formation are critical to the program's intellectual agenda.

Applicants must have completed an undergraduate degree and should demonstrate a general knowledge of African American history and an understanding of the disciplinary bases for the study of the African diaspora. Demonstrated knowledge in the field should include understanding relations among social, economic, and political structures and culture in African American life.

Fields of Emphasis. The fields of emphasis are focused in two general areas representing current faculty expertise of fields.

Issues of Development. History of the African Diaspora; social and cultural institutions; urban life, politics of culture; political economy of the Diaspora.

Cultural Studies. Comparative literatures and cultures; critical theory, popular culture, performance and film; and women's studies.

The University requires a minimum of two years or four semesters of academic residence for all Ph.D. programs. Academic residence is defined as enrollment in at least 4 units in the 100 or 200 series of courses. Every graduate student must enroll in and complete a minimum of 4 units of upper division or graduate coursework or both per regular semester or quarter of study. The program will require at least 48 semester units. At least 24 of the 48 units completed must be graduate courses in the Department of African American Studies. After successful completion of coursework with a minimum GPA of 3.3, the department will administer a pre-qualifying examination based on general knowledge in the field of African American studies.

Students who have been accepted to this program and have earned a master's degree in another program will be evaluated based on requirements for the pre-qualifying examinations.

Lower Division Courses
R1A. Freshman Composition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: UC Entry-Level Writing requirement. Formerly 1A. Training in expository, argumentative, and other styles of writing. The assignments will focus on themes and issues in African American life and culture. Satisfies the first half of the Reading and Composition requirement. (F,P) Staff
R1B. Freshman Composition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: UC Entry-Level Writing requirement and 1A. Formerly 1B. Continued training in expository and argumentative writing, with more emphasis on literary interpretation. Satisfies the second half of the Reading and Composition requirement. (F,P) Staff
4A. Africa: History and Culture. (4) Three hours of lecture and one hour of discussion per week. Emphasizes pre-colonial social, cultural, political, and economic structures; historical and cultural legacies; oral traditions, and belief systems. (F,P) Nwokeyi
4B. Africa: History and Culture. (4) Three hours of lecture and one hour of discussion per week. Emphasizes social, political, and economic change in 20th century Africa; with further emphasis upon the roles of modernization, urbanization, and emergence of contemporary African states. (F,P) Nwokeyi

prefix=cross-listed course
prefix=core course satisfies R& requirement
prefix=core course satisfies American Cultures requirement
prefix=online course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
5A. African American Life and Culture in the United States. (4) Three hours of lecture and one hour of discussion per week. A study of the development of African American culture in the United States, approached through an examination of selected art forms, historical themes, and intellectual currents. (FSP) Staff

5B. African American Life and Culture in the United States. (4) Three hours of lecture and one hour of discussion per week. Emphasis on the social experience of African Americans. An interdisciplinary approach designed to help students understand the forces and ideas that are influencing the individual and collective African American experience. (FSP) Staff

7A. Elementary Wolof. (4) Four hours of recitation and one hour of laboratory per week. Formerly C7A/Linguistics C7A. This course introduces students to speaking, listening, reading, and writing in Wolof. Instruction is mixed English and Wolof. Emphasis is placed on developing student ability to create and to communicate with basic Wolof structures and vocabulary in culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available from the Berkeley Language Center. Reading and writing are developed through in-class exercises, independent projects, and compositions. This course not open to native heritage speakers of Wolof. (F) Sow

7B. Elementary Wolof. (4) Four hours of recitation and one hour of laboratory per week. Prerequisites: C7A. Formerly C7B/Linguistics C7B. This course introduces students to speaking, listening, reading, and writing in Wolof. Instruction is mixed English and Wolof. Emphasis is placed on developing student ability to create and to communicate with basic Wolof structures and vocabulary in culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available from the Berkeley Language Center. Reading and writing are developed through in-class exercises, independent projects, and compositions. For students with no college level Wolof completed with passing grade; this course is not open to native heritage speakers of Wolof. (SP) Sow

8A. Intermediate Wolof. (4) Four hours of recitation and one hour of laboratory per week. Formerly C8A/Linguistics C8A. This course reviews and expands students’ knowledge of fundamental structures from Elementary Wolof and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Sow

8B. Intermediate Wolof. (4) Four hours of recitation and one hour of laboratory per week. Prerequisites: C8A. Formerly C8B/Linguistics C8B. This course reviews and expands students’ knowledge of fundamental structures from Elementary Wolof and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Sow

9A. Advanced Wolof. (4) Four hours of recitation and one hour of laboratory per week. Formerly C9A/Linguistics C9A. This course reviews and expands students' knowledge of fundamental structures from Elementary Wolof and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Sow

9B. Advanced Wolof. (4) Four hours of recitation and one hour of laboratory per week. Prerequisites: C9A. Formerly C9B/Linguistics C9B. This course reviews and expands students' knowledge from Intermediate Wolof. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by the instructor's materials. (F) Sow

9C. Advanced Wolof. (4) Four hours of recitation and one hour of laboratory per week. Prerequisites: C9A. Formerly C9B/Linguistics C9B. This course reviews and expands students' knowledge from Intermediate Wolof. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Sow

10A. Intermediate Swahili. (4) Students will receive no credit for C10A after taking Linguistics 10A. Four hours of recitation and one hour of laboratory per week. Prerequisites: C10A/Linguistics C10A. This course reviews and expands students' knowledge of fundamental structures from Elementary Swahili and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (F) Jibril

10B. Intermediate Swahili. (4) Students will receive no credit for C11B after taking Linguistics 1B. Four hours of recitation and one hour of laboratory per week. Prerequisites: C10A. Formerly C11B/Linguistics C11B. This course reviews and expands students' knowledge of fundamental structures from Elementary Swahili and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Jibril

10C. Intermediate Swahili. (4) Students will receive no credit for C11B after taking Linguistics 1B. Four hours of recitation and one hour of laboratory per week. Prerequisites: C10A. Formerly C11B/Linguistics C11B. This course reviews and expands students' knowledge of fundamental structures from Elementary Swahili and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Jibril

11A. Elementary Swahili. (4) Students will receive no credit for C11A after taking Linguistics 1A. Four hours of recitation and one hour of laboratory per week. Formerly C11A/Linguistics C11A. This course introduces students to the basic structures of Swahili, including vocabulary, grammar, and pronunciation. Reading, writing, and instruction is in Swahili. Emphasis is placed on developing student ability to create and communicate with basic structures in oral and written context. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through in-class exercises, independent projects, and compositions. This course is not open to native or heritage speakers of Swahili. (F) Mchombo
11B. Elementary Swahili. (Students will receive no credit for C11B after taking Linguistics 1B. Four hours of recitation and one hour of laboratory per week. Prerequisites: C11A. Formerly C14A/Linguistics C1B. This course introduces students to the basics of speaking, listening, reading, and writing in Swahili. Instruction is mixed English and Swahili. Emphasis is placed on developing student ability to create and to communicate with basic structures and vocabulary in a culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available from the Berkeley Language Center. Reading and writing are developed through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Swahili. (SP) Sibanda

13A. Elementary Zulu. (Four hours of lecture and one hour of laboratory per week. Formerly C13A/Linguistics C3A. This course introduces students to speaking, listening, reading, and writing in Zulu. Instruction is mixed English and Zulu. Emphasis is placed on developing student ability to create and to communicate with basic structures and vocabulary in a culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available from the Berkeley Language Center. Reading and writing are developed through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Zulu. (F) Sibanda

13B. Elementary Zulu. (Four hours of lecture and one hour of laboratory per week. This course introduces students to speaking, listening, reading, and writing in Zulu. Instruction is mixed English and Zulu. Emphasis is placed on developing student ability to create and to communicate with basic structures and vocabulary in a culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available from the Berkeley Language Center. Reading and writing are developed through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Zulu. (F) Sibanda

C13A. Elementary Zulu. (Four hours of lecture and one hour of laboratory per week. This course reviews and expands students' knowledge of fundamental structures from Elementary Zulu. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available from the Berkeley Language Center. Writing and reading are developed through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (F) Sibanda

C13B. Elementary Zulu. (Four hours of lecture and one hour of laboratory per week. This course reviews and expands students' knowledge of fundamental structures from Elementary Zulu. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available from the Berkeley Language Center. Writing and reading are developed through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (SP) Sibanda

14A. Intermediate Zulu. (Four hours of lecture and one hour of laboratory per week. Formerly C14A/Linguistics C4A. This course reviews and expands students' knowledge of fundamental structures from Elementary Zulu. Oral and written communication is emphasized in a culturally and socially appropriate context. Speaking and writing abilities are developed through oral exercises, individual reports, class discussions, and recordings available from the Berkeley Language Center. Writing and reading are developed through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Zulu. (SP) Sibanda

14B. Intermediate Zulu. (Four hours of lecture and one hour of laboratory per week. Formerly C14B/Linguistics C4B. This course reviews and expands students' knowledge of fundamental structures from Intermediate Zulu. Oral and written communication is emphasized. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (SP) Sibanda

15A. Advanced Swahili. (Four hours of recitation and one hour of laboratory per week. Formerly C15A/Linguistics C15A. This course reviews and expands students' knowledge from Intermediate Swahili. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (F) Mchombo

C15A. Advanced Swahili. (Four hours of lecture and one hour of laboratory per week. This course reviews and expands students' knowledge from Intermediate Swahili. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (SP) Mchombo

15B. Advanced Swahili. (Four hours of recitation and one hour of laboratory per week. Prerequisites: Elementary Swahili C10A-C10B; Advanced Swahili C15A. This course reviews and expands students' knowledge from Intermediate Swahili. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (SP) Mchombo

19A. Advanced Zulu. (Four hours of lecture and one hour of laboratory per week. Formerly C19A/Linguistics C19A. This course reviews and expands students' knowledge from Intermediate Zulu. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (SP) Sibanda

C19A. Advanced Zulu. (Four hours of lecture and one hour of laboratory per week. This course reviews and expands students' knowledge from Intermediate Zulu. Oral and written communication will be presented in appropriate cultural contexts. Developing oral language skills will be strongly emphasized as part of this course and will be expanded through individual presentations, class discussions, and recordings available at the Berkeley Language Center. Writing, grammar, vocabulary, and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley's African Library Collection and supplemented by instructor's materials. (F) Sibanda

b prefix=language course for business majors
C prefix=course satisfies American Cultures requirement
H prefix=honors course
R prefix=course satisfies R & requirement
AC prefix=suffix course satisfies American Cultures requirement
W prefix=online course
*Professor of Distinguished Teaching Award
†Recipient of Distinguished Teaching Award
Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Sibanda

24. Freshman Seminars. (Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a pass/no pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester.)

27AC. Lives of Struggle: Minorities in a Majority Culture. (3) Three hours of lecture per week. The purpose of this course is to examine the many forms that the struggle of minorities can assume. The course is focused on minorities in the United States and the Americans who defined and perceived by the individuals themselves. Members of three minority aggregates are considered: African Americans, Asian Americans (so called), and Chicanos/Latinos Americans. The choice of these three has to do with stories of members of these aggregates. Such differences have contributed somewhat different approaches to struggle. This course satisfies the American Cultures requirement. (F,SP) Hinzen

28AC. Globalization and Minority American Communities. (3) Three hours of lecture per week. An examination of the movement of individuals, ideas, ideologies, and institutions between minority American communities in the United States—African Americans, Asian Americans, Chicanos—and their cultures of origin in the 19th and 20th centuries. The course will utilize the concepts of “migration,” “diapora,” “otherness,” “global village,” “melting pot,” and “biculturalism” to draw largely on social science perspectives. This course satisfies the American Cultures requirement. (SP) Small

30A. Elementary Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Formerly C31A/Linguistics C31A. This course introduces students to speaking, listening, reading, and writing in Chichewa. Emphasis is placed on developing student ability to create and to communicate with basic Chichewa structures and vocabulary in a culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available at the Berkeley Language Center. Reading and writing are expanded through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Chichewa. (F,SP) Mchombo

30B. Elementary Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Prerequisites: C19A. Formerly C30B/Linguistics C30B. This course introduces students to speaking, listening, reading, and writing in Chichewa. Instruction is mixed English and Chichewa. Emphasis is placed on developing student ability to create and to communicate with basic Chichewa structures and vocabulary in a culturally and socially appropriate context. Speaking and listening abilities are developed through oral exercises, class discussions, and recordings available at the Berkeley Language Center. Reading and writing are expanded through in-class exercises, independent reading projects, and compositions. This course is not open to native or heritage speakers of Chichewa. (F) Mchombo

30C. Intermediate Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Prerequisites: C19A. Formerly C30C/Linguistics C30C. This course reviews and expands students’ knowledge of fundamental structures from Elementary Chichewa and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (F) Mchombo

31A. Intermediate Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Formerly C31A/Linguistics C31A. This course reviews and expands students’ knowledge of fundamental structures from Elementary Chichewa and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Mchombo

31B. Intermediate Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Prerequisites: C31A. Formerly C31B/Linguistics C31B. This course reviews and expands students’ knowledge of fundamental structures from Elementary Chichewa and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (SP) Mchombo

31C. Intermediate Chichewa. (4) Four hours of lecture and one hour of laboratory per week. Prerequisites: C31A. This course reviews and expands students’ knowledge of fundamental structures from Elementary Chichewa and appropriate cultural contexts of these structures in oral and written communication. More grammar and vocabulary in a culturally and socially appropriate context is developed. Speaking ability is expanded through oral exercises, individual reports, class discussions, and recordings available at the Berkeley Language Center. Writing and reading are expanded through compositions, written exercises, and independent reading projects with texts available through Berkeley’s African Library Collection and supplemented by the instructor’s materials. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F,SP) Staff

98. Directed Readings for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Staff

99. Supervised Independent Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Supervised independent study is offered in all campus departments; topics vary from department to department and from semester to semester. (F,SP) Staff

100. Introduction to African American Studies. (4) Three hours of lecture and one hour of discussion per week. Prerequisite: Readings in Political and Economic Development in the Third World. This course will examine theoretical, methodological, and historical issues related to African American studies. The class will discuss the social relevance of African American studies, the political origins of the discipline, and the debate over Afrocentricity. Special attention will be devoted to the contributions of black feminist theory and community scholars/organic intellectuals to the development of the discipline. (F,SP) Staff

101. Research Methods for African American Studies. (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: Introductory statistics. As an introduction to interdisciplinary research methods as they are applied to the study of African American communities, the course will examine theoretical and conceptual issues; techniques for identifying existing research; and sources and methods of social research and data collection. The main focus will be on qualitative methods.

107. Race and Public Policy. (3) Three hours of lecture per week. This course examines the formation and implementation of public policies directly relevant to the black community. While the policies analyzed are tied to the black community, the policies are relevant to many other segments of society. (SP) Staff

109. Black and Male in American Life. (3) Three hours of lecture per week. Prerequisite: Upper division status. The course examines ways gender and race constructions shape the lives of African American males. Developmental in design, we examine black males in the context of childhood, adolescence, gender relations and family, and the world of work. (SP) Staff

111. Race, Class, and Gender in the United States. (3) Three hours of lecture per week. Prerequisites: Reading and Composition requirement. Emphasis on social class and community power and the relationship between race, class, and gender relations in American society. Emphasizes both similarities and differences, and highlights gender politics. (F,SP)

112A. Political and Economic Development in the Third World. (4) Four hours of lecture per week. An
112B. Political and Economic Development in the Third World. (4) Three hours of lecture and one hour of discussion per week. A critical appraisal of the theoretically-based policies employed by Third World nations. Attempts at transition to modernized developed socio-political and economic systems and an examination of the international and intranational impediments to Third World development. The focus will be on actual processes that represent the diversity of developing countries. (SP) Hintzen

116. Slavery and African American Life Before 1865. (4) Three hours of lecture and one hour of discussion per week. This course will examine the origins of the African slave trade, and explore political, economic, demographic and cultural factors shaping African American life and culture prior to 1865. (F.SP) Taylor

117. African Americans in the Industrial Age, 1865-1970. (4) Three hours of lecture and one hour of discussion per week. With emphasis given to the organization of labor after slavery, this course will explore the history of African American cultural, institutional, and protest traditions from the Civil War to the Civil Rights Movement. (SP) Taylor

119. Selected Topics in the Sociohistorical Development of the Third World. (1-4) Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Determined by offering. Topics will vary each semester. (F.SP)

121. Black Political Life in the United States. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 5B or 116 and 117 or History 125A-125B. Analysis of the theoretical and historical development of African American political forms and expression. Examination of local, state, and federal political processes, political activities, and the movement of black political ideologies, organizations, and movements. Henry

122. African American Families in American Society. (3) Three hours of lecture per week. Prerequisites: 5B or 116 and 117 or History 125A-125B. Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Determined by offering. Topics will vary each semester. (F.SP)

123. Social and Political Thought in the Diaspora. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 5B or 116 and 117 or History 125A-125B. Analysis of the theoretical and historical development of African Americans’ political forms and expression. Examination of local, state, and federal political processes, political activities, and the movement of black political ideologies, organizations, and movements. Henry

124. Political Philosophy of Martin Luther King Jr. (3) Three hours of lecture per week. Using the thought and actions of Martin Luther King Jr., this course examines the major events of the Civil Rights Movement. Reading includes original works by King as well as secondary sources with a special emphasis on African American religion, nonviolence, and integration. (F.SP) Staff

125. History of the Civil Rights Movement. (4) Three hours of lecture per week. The objective of this course is to examine the modern Civil Rights Movement. As understood traditionally, this period began with the Supreme Court decision Plessy v. Ferguson in 1896. This course will seek to place this movement in the context of global developments and in the context of the broad swathe of U.S. history. The course may include many of historical texts and autobiographies. Lectures will place the readings in context, discussing the material and its significance in the overall history and culture of African American life. (F.SP) Taylor

126. African American Women’s History. (4) Three hours of lecture per week. The objective of this course is to examine substantive issues in the African American female experience from colonial times to the present. The dominant themes of this course include family, work, community, sexuality, and individual and collective activism. Particular attention will be paid to the interactions between race, class, and gender in American society. Assigned readings consist of an introduction to the scholarly secondary literature on African American women’s history. Lectures and discussions will examine the readings in context. Videos will augment the lectures and discussions. (F) Taylor

131. Caribbean Societies and Cultures. (3) Three hours of lecture per week. Prerequisites: Comparative study of Spanish-, Dutch-, English-, and French-speaking Caribbean societies. Analysis of Caribbean social structure including the development of plantation system, urban dynamics, ethnic politics, family structures, and ecology of African Caribbean religions. (SP) Laguerre

132. Psychology of African American People: Current Issues. (3) Three hours of lecture per week. Prerequisites: African 5B or 101A, or upper division course in psychology. Examines psychological research and theory pertaining to African American people. Emphasis on understanding the concerns, methods, and conclusions regarding African Americans offered by American psychology from its origins to the present. Also listed as Psychology C105.

133A. Race, Identity, and Culture in Urban Schools. (3) Three hours of seminar/discussion per week. Prerequisites: Determined by offering. Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Determined by offering. Topics will vary each semester. (F.SP) Staff

134. Information Technology and Society. (4) Three hours of lecture per week. This course will focus on understanding urban schools as a system of social stratification and the process by which students in urban schools come to see themselves as students, as members of cultural and racial groups, and as young people in America. Topics include racial identity; race/ethnicity in schools; urban neighborhood context; and schooling in the juvenile justice system. Students will also integrate course readings with their own first-hand experience working in one of several off-campus partner organizations. The course has a mandatory community engagement component for which students will earn 1 unit of field study (197) credit. Also listed as Education C181. (SP) Suad-Bakari

135. Caribbean Cultural History. (3) Three hours of lecture per week. Prerequisites: 5B. An examination of the history and cultural evolution of the Caribbean from the decline of the slave economy in the Caribbean to World War II. Particular attention will be paid to African-Caribbean cultural institutions and practices; immigration of Chinese, East Indians, Lebanese, and Jews; the post-emancipation period; political history; and the historical and structural evolution of Caribbean cities. (F) Laguerre

137. Multicultural Communities. (3) Three hours of seminar per week. Prerequisites: 5B. Examination of theoretical issues in multicultural education and the role of the United States as a multicultural society. Comparative analysis of the ecology and social structure of African American, Native American, African, Mexican American, and Afro-Caribbean urban communities, with special emphasis on social class, ethnicity, and culture. (SP) Laguerre

138. Black Nationalism. (4) Four hours of lecture per week. Prerequisites: 5B. Examines the concept of black nationalism and its historical and intellectual development. Special attention will be given to the role of African American religion and the attempt to develop "black socialism." (F) Henry

139. Selected Topics of African American Social Organization and Institutions. (1-4) Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Determined by offering. Topics will vary each semester. (F.SP) Staff

140. Special Topics in Cultural Studies. (1-4) Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Determined by offering. Topics will vary each semester. (F.SP) Staff

142A. Topics in World Cinema. (4) Three hours of lecture, plus two hours of viewing/discussion per week. Prerequisites: Reading and Composition requirement. Examines through lectures and a selection of films, the development and achievements of Third World motion picture artistry. Social, political, and cultural themes are discussed, with particular emphasis given to major works from Asia, Africa, and Latin America. Other newly developed film sources from abroad are presented for critical analysis. (F) Taylor

142AC. Race and American Film. (4) Three hours of lecture and two hours of viewing/discussion per week. Prerequisites: Reading and Composition requirement satisfied. This course uses film to investigate the central role of race in American culture and history. Using films as the primary texts, the course will explore the relationship between these films and the social and political contexts from which they emerged. Looking at both mainstream and independent cinema, the course will consider the cultural, political, and social contexts in which these films were made. Important works that formed specific images of black Americans, aligned with other ethnic minorities, with attention to comparative changes in their filmic depictions, from the silent era to the present. Important works that formed specific images of the diverse American population (including Native Americans, Asian Americans, Mexican Americans, the “Third World,” and “multiculturalism” have been represented in film. Themes covered include representing race and nation, the borderlands; passing and miscegenation; and the intersections of race, gender, and sexuality. This course satisfies the American Cultures requirement. (F.SP) Taylor

142B. The Cross-Cultural Images of American Minorities in Film. (4) Three hours of lecture and two hours of viewing/discussion per week. Prerequisites: Reading and Composition requirement. A critical, historical course describing the cross-cultural images of black Americans, aligned with other ethnic minorities, with attention to comparative changes in their filmic depictions, from the silent era to the present. Important works that formed specific images of the diverse American population (including Native Americans, Asian Americans, Mexican Americans, the “Third World,” and “multiculturalism” have been represented in film. Themes covered include representing race and nation, the borderlands; passing and miscegenation; and the intersections of race, gender, and sexuality. This course satisfies the American Cultures requirement. (F.SP) Taylor

143A. Research-to-Performance Laboratory. (3) Three hours of lecture per week. Prerequisites: 143A
or consent of instructor. Development of scholarly material for theatrical presentation and enhancement of dramatic performance techniques through discussions, presentations, and productions of works of art either by the class and/or writers in other African American studies courses. All source material will be based on the research of scholars in the field of African American studies. Also listed as Theater, Dance, and Performance St C138B.

143C. Black Theatre Workshop. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 143A or equivalent, or consent of instructor. Study and production of a play by an African American playwright. The play will be studied within its social and historical context. Students will be introduced to the various aspects of theatre production. Also listed as Theater, Dance, and Performance St C138B.

144. Introduction to Cultural Studies: Black Visual Culture. (4) Three hours of lecture per week. Prerequisites: Re-reading and Composition requirement. This course examines theories of culture and contemporary issues in popular culture. The course focuses on the instrumentality of culture as a vehicle of domination and resistance. The goal of the course is to provide the student with a critical vocabulary for cultural analysis. Key issues to be examined are ideology, hegemony, race, and class formation. Students must have a willingness to engage new and difficult ideas. (F,SP) Raiford

150B. African American Literature 1920 to Present. (3) Three hours of lecture per week. Survey of African American literature from the Harlem Renaissance to the present. A close analysis of major writers, premises. (F,SP) Scott

151B. Contemporary African American Drama. (4) Four hours of lecture per week. Prerequisites: 151A or consent of instructor. Survey of contemporary plays in order to analyze the impact of the black experience in American theatre. Emphasis on predominant themes, structural tendencies, socio-historical context. Also listed as Theater, Dance, and Performance St C113B. (SP)

152F. Neo-Slave Narratives. (3) Three hours of lecture per week. This course explores African American fiction written during the 1970s and 1980s that attempt to represent the urtext of African American literature—and/or to represent for contemporary readers the lives of African slaves in the United States. In what ways do these authors imagine the experience and effects of slavery from their vantage point a century after emancipation and with the Civil Rights and Black Power Movements shaping the context of their writing? (F,SP) Scott D.

153A. Images of African American Women in Literature: Slavery to the 20th Century. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Reading and Composition requirement. Analysis of the cultural, literary, and social assumptions that contribute to the various images of African American women in Western literature and African American writing. This course explores the literature of 19th-century America, an expanding field in American literary discourse. Also listed as Gender and Women's Studies C153A. (F)

153B. Contemporary Images of African American Women in Literature. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Reading and Composition requirement. Analysis of the cultural and social assumptions and dynamics that shape the image of the African American woman in contemporary Western literature and African American writing. Also listed as Gender and Women's Studies C153B. (SP)

153C. Novels of Toni Morrison. (3) Three hours of lecture per week. Prerequisites: Reading and Composition requirement. We will closely read several of Nobel Laureate Toni Morrison's novels, as well as a short story and some of her essays, considering the works in relation to her interest in creating what she calls "village literature" and in writing literature that does "trope work" that intervenes in American representations of blackness and racial identity; her contributions to the renaissance of black women's writing (and African American literature in general) in the 1980s and 1990s. (F,SP) Scott, D.

154. Negritude: French African Literature. (4) Three hours of lecture per week. Prerequisites: Reading and Composition requirements. Emphasis on Negritude and racial consciousness in the creative and political writings of French-speaking Africans and Antillean. Includes close readings of works by Aime Cesaire, Frantz Fanon (translated by Harry C. Kane, Ferdinand Oyono, and Joseph Zobel. Students learn to revise the literary history of Negritude (1931-1966) through examinations of primary sources. Clark

155. Literature of the Caribbean: Significant Themes and Authors. (4) Three hours of lecture per week. Prerequisites: Reading and Composition requirement. An introduction to representative works, themes, and discussions in Caribbean literatures—produced by authors from the Anglophone, Creolephone, Francophone, and Hispanophone areas within Plantation America. Includes examinations of indigenous folkways and nation languages as sources for a re-examination of Caribbean culture and literary history. (F) Clark

156AC. Poetry for the People: Introduction to the Art of Poetry. (4) Course may be repeated for credit. Two to three hours of lecture and one to two hours of discussion per week. A large lecture/discussion class which introduces students to poetry as culture, history, criticism, politics, and practice. Focusing, comparatively, on poetry from three African/ethnic groups, this course requires students to learn both the technical structure of various forms of poetry as well as the particular poetic traditions. The groups and traditions vary from semester to semester. This course satisfies the Arts and Literature breadth requirement. This course satisfies the American Cultures requirement. (F,SP)

158A. Poetry for the People: The Writing and Teaching of Poetry. (4) Four hours of seminar per week, plus community workshop teaching. Prerequisites: 156AC plus consent of instructor. The focus of this course is on the writing of poetry, and students undertake an intensive study of both the techniques of poetry and the social and cultural context of specific poetic traditions. Students must "imitate" the poems they study, write critical papers comparing poetic traditions, and complete an original manuscript of new poems. In addition, they must produce an on-campus poetry reading and are required to teach for five to seven weeks at one of the assigned Poetry for the People workshops. Students also visit the Department, the Arts and Literature breadth requirement. This course satisfies the American Cultures requirement. (F)

158B. Poetry for the People: Practicum. (4) Four hours of seminar, plus peer teaching and performance. Prerequisites: 158A. A teaching practicum, with the regular active participation of the instructor. For students who completed 156AC during the previous year and 158A in the previous fall. They serve as student teacher poets for 156AC. The focus of 158B is on the teaching of poetry. Each student poet is responsible for a group of seven to 10 students, and, under the direct supervision of the instructor, helps the students in his/her group learn to read, criticize, and produce poetry. This course satisfies the American Cultures requirement. (SP)

159. Special Topics in African American Literature. (1-4) Course may be repeated for credit. One to four hours of lecture per week per unit. Prerequisites: Reading and Composition requirement, plus those set by instructor. Special topics in African American literature. (F,SP)

160. African Literatures. (4) Three hours of lecture per week. An introduction to writings by African authors from the Anglophone, Francophone, and Lusophone regions of colonized Africa. The course sets the readings within the contexts of their production from the 1930s through 1980s, from independence through independence, and neo-colonialism or post-colonial writing. Clark

161. African Theater. (4) Three hours of lecture per week. Prerequisites: 160 or consent of instructor. The course introduces students to dramatic texts produced in France, Africa, and the Caribbean from 1958 to the present. From Genet’s The Blacks through Aidoob’s Noana, the perspective of analysis engages theory with practice. Based on a research-to-performance method, the course requires students to produce a one-act play derived from former or current research efforts. Clark

162. Caribbean Literature by Women Authors: Marais and Beyond. (4) Three hours of lecture per week. This course in literary theory uses concepts of twinning in African Diaspora discourse as a means of overcoming binary oppositions in contemporary writing by women from the Caribbean. The course includes readings and testimonial literature by authors from the Creole, English, French, Portuguese, and Spanish Caribbeans—namely, contemporary works by Merle Hodge, Jean Rhys, and Simone Schwartz-Bart. (F,SP) Clark

170. Fanon and the Network Society. (4) Three hours of seminar per week. Fanon is one of the foremost theorists of race and decolonization in the 20th century. Today, we are no longer under the Cold War, racism is taking a new turn, and the technification of society may make us believe that reading Fanon may have historical interest but be irrelevant to deal with issues brought about by globalization and the network society. The course includes readings in the humanities and social sciences, along with Frantz Fanon’s texts on decolonization, society, and subjectivity, in order to imagine a more just, democratic, and “human” society. Also listed as Ethnic Studies C170. (F) Maldonado-Torres

178. Cultural Studies. (4) Three hours of lecture/discussion per week. Although the Caribbean has been recognized in recent years as being one of the most compelling areas in regard to questions of imperialism, hybridity, and race, the Dutch-speaking part of it has somehow been neglected. This course intends to give an opportunity to those who do not necessarily have a command of Dutch language, but wish to be exposed to the knowledge of Latin-American and Caribbean history, culture, and literature. Also listed as Spanish C178 and Dutch C178. (F,SP) Staff

190AC. Advanced Seminar in African Diaspora Studies. (3-4) Course may be repeated for credit as topic varies. Three hours of lecture per week. For a 4-unit course, an extra assignment/research component will be added to the course to increase contact hours with students. Possible components include additional readings, outside of class research projects and other projects that the instructor feels will add to the value of the course. Topics to be announced at the beginning of each semester. This course satisfies the American Cultures requirement. (F,SP) Staff

Upper Division Courses

H195A-H195B, Senior Honors Thesis. (3) Regular individual meetings with faculty sponsor. Credit and grade to be awarded on completion of sequence. Prerequisites: Senior standing and 3.5 GPA overall and in major. The student will complete a primary research project based on an advanced topical area. The student must choose an instructor and topic with faculty sponsor. Fullfills department thesis requirement. Application and details at departmental adviser’s office. Students must enroll for both semesters of the sequence. (F,SP) Staff

197. Field Study in African American Life. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Must be taken on a pass/no pass basis. Field study of off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. Independent study form available in department office. (F,SP) Staff

198. Directed Group Studies for Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a pass/no pass basis. Credit to be awarded on completion of sequence. (F,SP) Staff

104 / African American Studies
and multiple identities will be analyzed. Postnational territorialization in the production of bipolar, fragmented, discussed. The technology of the infrapolitics of minor-

256A. Multiculturalisms. (4)

Taylor American female experience from colonial times to

American culture. (SP)

artists, and other thinkers have played in American

the social and cultural roles that writers, scholars,

sent. Implicit in the examination is consideration of

examine the development of an intellectual group in

(4)

Staff

from term to term depending on student demand and faculty availability. (F,SP) Staff

240. Special Topics in Cultural Studies of the Diaspora, (1-4) Course may be repeated for credit. One to four hours of independent study per week. One hour of lecture per week per unit. Topics will vary from term to term depending on student demand and faculty availability. (F,SP) Staff

241. Special Topics in Development Studies of the Diaspora, Three hours of lecture per week. This course is designed for graduate students who choose to become experts in quantitative research methods. There is a special emphasis on survey research techniques and procedures. Each student will be expected to have begun a project in 201A designed for survey research techniques and computer-based quantitative procedures. Students will concentrate on the phases of the project that require questionnaire construction, interviewing, data processing, and data analysis. Hintzen

250. Black Intellectuals: Social and Cultural Roles. (4) Three hours of seminar per week. The course will examine the development, including that of an intellectual group in African American life from the 18th century to the present. Implicit in the examination is consideration of the social and cultural roles that writers, scholars, artists, and other thinkers have played in African American and African American culture. (SP) Staff

251. African American Women’s History. (4) Three hours of seminar per week. The objective of this course is to examine substantive issues in the African American experience from colonial times to the present. The dominant themes of this course include family, work, community, sexuality, and individual and collective activism. (F) Taylor

256A. Multiculturalisms. (4) Three hours of sem-

inar per week. This course uses an epistemological and hermeneutic approach to locate and study the ethnic question in the United States, Canada, and Europe. It examines the social construction of ethnicity and deconstructs it in relation to the gender and class subject. Modernism and post-modernist theories dealing with state formation and inter-ethnic relations will be scrutinized. National, transnational, and global aspects of ethnicity will be discussed. The course will focus on the infrastructures of minority groups in both colonial and post-colonial settings will be assessed. (F) Lagueur

256B. Diaspora, Citizenship, and Transnationality, (4) Three hours of seminar per week. This seminar analyzes the social construction and reproduction of diasporic identities in the United States, Canada, and Europe. It examines the relations of the diaspora to the homeland in the context of the globalization process. The role of transnational migration and deter-

tior theories and practices of critical pedagogy at the uni-

versity level. Examines the arts of teaching and learn-

ing and current disciplinary and cross-disciplinary issues in African/ Diaspora and ethnic studies. Par-

ticipation and environmental public ecologies in 39.

Introduction to the University: African American Per-

spectives, is mandatory. The course is required for students expecting to serve as graduate student instructors in the department. Also listed as Ethnic Studies Graduate Group C301. (F,SP)

Agricultural and Resource Economics (College of Natural Resources)

Department Office: 207 Giannini Hall, (510) 642-3345

Chair: Brian Wright

Professors

Peter Berck, Ph.D. Massachusetts Institute of Technology. Natural resources, applied econometrics. (SP)

Severn Borenstein (Professor of Business Administration and Agricultural and Resource Economics), Ph.D. Massachusetts Institute of Technology. Industrial organization and government regulation, law and economics, applied macroeconomics. (SP)

Alain de Janvry, Ph.D. University of California, Berkeley. International rural economic development. (SP)

Anthony C. Fisher, Ph.D. Columbia University. Natural resources and environmental public ecologies in 39. Introduction to the University: African American Perspectives, is mandatory. The course is required for students expecting to serve as graduate student instructors in the department. Also listed as Ethnic Studies Graduate Group C301. (F,SP)

Agricultural and Resource Economics / 105

602. Individual Study for Doctoral Students. (2-12) Course may be repeated for credit. Individual confer-

ences. Must be taken on a satisfactory/unsatisfactory basis. (SP) Staff

Professional Courses C301. Critical Pedagogy: Instructor Training. (4) Two hours of seminar and two hours of practicum per week. The seminar provides a systematic approach to theories and practices of critical pedagogy at the un-

iversity level. Examines the arts of teaching and learn-

ing and current disciplinary and cross-disciplinary issues in African/ Diaspora and ethnic studies. Par-

ticipation and environmental public ecologies in 39.

Introduction to the University: African American Per-

spectives, is mandatory. The course is required for students expecting to serve as graduate student instructors in the department. Also listed as Ethnic Studies Graduate Group C301. (F,SP)
Undergraduate Program

Choice of College

Students can complete a major in environmental economics and policy in either the College of Letters and Science for a Bachelor of Arts (B.A.) degree or the College of Natural Resources for a Bachelor of Science (B.S.) degree. Major and breadth requirements are identical for all students, regardless of college. Refer to the website of the appropriate college for details. All students must complete the L&S seven-course breadth requirements and essential skills before graduation. Junior transfer students may satisfy these requirements by completing IGETC.

Major in Environmental Economics and Policy

The undergraduate major in environmental economics and policy (ENVECON) offers an opportunity to explore those aspects of economic and political institutions that affect the development and management of natural resources and the environment. The focus of concern includes both renewable resources such as food, forests, and water, and resources in fixed supply such as land and minerals. The distinctive feature of the major is that it adopts a problem-solving approach to these issues. The core requirement for the major is microeconomic theory, and the economics of resources and the environment. These core courses are supplemented by other courses that apply the methods of social science to resource problems.

The major is structured to ensure that students obtain a sufficient background in the natural and physical sciences and sufficient training in basic mathematics, statistics, and communication skills in order to approach resource-related issues in an effective and practical manner. It can also be excellent preparation for business school. Students who graduate by preparing to undertake a career in public or private agencies and firms engaged in the planning or management of natural resources, or to enter a graduate school for further study in programs such as economics, law, public policy, business, or resources administration.

Lower division major requirements include a course in microeconomics and courses in calculus (equivalent to Mathematics 16A-16B or 1A-1B) and statistics.

Upper division work includes courses in methods, core courses in environmental economics and policy, and courses in an area of concentration chosen by the student. For specific major requirements, stop by the Student Services office, 203 Giannini Hall, call (510) 642-3347; or visit are. berkeley.edu/UnderGradStudy.html.

Minor Program

Students may declare a minor in environmental economics and policy. A minimum of six courses from the ENVECON curriculum is required. Students must declare in advance their intention to minor with the undergraduate adviser. Students who believe they have already completed the requirements for a minor should apply for departmental certification. For more information, contact:

Gail Vawter, Student Affairs Officer, 203 Giannini Hall, (510) 642-3347.

Graduate Programs

The Department of Agricultural and Resource Economics offers programs leading to the M.S. and Ph.D. degrees. Because of quota limitations, students are rarely admitted for the master’s degree, although it may be awarded to students who are pursuing work toward the Ph.D. in our program (or in another field at Berkeley) after fulfillment of the appropriate M.S. requirements. Applicants should have completed the M.S. (or agricultural economics) comparable to a bachelor’s degree at the University of California and must have demonstrated strong scholarship potential.

The agricultural and resource economics program is relatively flexible; however, the program stresses economic theory, quantitative methods, and two elective fields defined in consultation with the graduate adviser. Some common elective fields include agriculture in economic development, after taking Economics 1. Three hours of lecture and one hour of discussion per week. Prerequisites: 100, or Economics 100A or 101A. This course introduces students to the basic economic micro and macro frameworks, and policy, and courses in an area of concentration chosen by the student. For specific major requirements, stop by the Student Services office, 203 Giannini Hall, call (510) 642-3347; or visit are. berkeley.edu/UnderGradStudy.html.

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Gail Vawter, Student Affairs Officer, 203 Giannini Hall, (510) 642-3347.
141. Agricultural and Environmental Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100, or Economics 100A or 101A. This course considers the formative, implementation, and impact of public policies affecting agriculture and the environment. Economic approaches to public lawmaking, including theories of legislation, interest group action, and regulatory control of bureaucratic agencies. Case studies include water allocation, endangered species protection, water quality, food safety, drainage, wetlands, pesticides, and farmerhood safety. Emphasis on examples from California. (F)

142. Industrial Organization with Applications to Agricultural and Natural Resources. (3) Three hours of lecture per week. Prerequisites: 100, or Economics 100A or 101A. Organization and performance of agricultural and environmental markets. Conduct of firms within these markets, such as price competition, product differentiation, predatory pricing, vertical integration, dealer networks, and advertising. The role of public policy in the markets. Case studies include oil cartel OPEC, agricultural cooperatives, vertical integration of food processors, and franchising of fast-food chains. (SP) Villas-Boas

143. Economics of Innovation and Intellectual Property. (3) Three hours of lecture per week. Prerequisites: 100, or Economics 100A or 101A. This course explores the economics of research and development with applications to innovation for including intellectual property rights. Topics include the standard modern economics of invention; modern intellectual property rights; incentives for research and development from agriculture, energy, pharmaceutic, software, and electronics; the roles of the public and private sectors; innovation and market structure; the needs of the poor; and global intellectual property negotiations. (F) Wright

145. Health and Environmental Economic Policy. (3) Three hours of lecture per week. Prerequisites: Intermediate microeconomics, 100, Economics 100 or 101A, and some statistics. This course introduces students to key issues and findings in the field of health and environmental economics. The first half of the course focuses on the theoretical and statistical frameworks used to analyze instances of market failure in the provision of health and environmental goods. The second half focuses on policy-relevant empirical findings in the field. (F) Anderson

147. Regulation of Energy and the Environment. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Intermediate microeconomic theory and calculus. This is an applied economics course on government regulation of energy with an emphasis on policies that seek to mitigate the impact of energy production and consumption on the environment. This course is designed to help students make connections between economic concepts and real world regulatory policy questions and issues. (SP) Fowle

C151. Economic Development. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100, or Economics 100A or 101A. Problems of underdevelopment and poverty, policy issues, and development strategy. Also listed as Economics C171. (F) de Janvry

152. Advanced Topics in Development and International Trade. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100 or Economics 100A. This course discusses recent efforts to understand behavior and institutions in village economies, with particular attention paid to the importance and compression analysis of savings, consumption, insurance, production, trade, welfare distribution and institutions of villages in developing countries. Roughly equal parts of theory, evidence, and policy. (F) Molavi Baryar

153. Environmental, Resource, and Development. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Intermediate microeconomic theory or consent of instructor. This course takes an interdisciplinary approach to the complex interactions between economics, environmental science, and resource management. It is a critical study of economic development, including the leading theories for understanding these interactions. The origins and history of current debates are discussed as well as some of the major issues stemming from these debates, such as immigration, international trade, family planning, policies, and concerns over the global commons. Specific natural resources and services like fresh water, food supply, and forest cover are analyzed as major components of sustainable development. (SP) Staff

154. Economics of Poverty and Technology. (3) Three hours of lecture per week. Prerequisites: Intermediate microeconomics. Introduction to the economic framework underlying the use of technology to address rural poverty. Emphasis is placed on the path of technology development from innovation and design to the adoption and use of technology in rural economies. Focuses on technologies related to agricultural production, land rights, value chains, and climate change. (SP) Boettiger

161. Advanced Topics in Environmental and Resource Economics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100, or Economics 100A or 101A; 101 recommended. The roots of environmental and resource economics. Theories of land and resource rent. Models of optimal use of renewable and nonrenewable resources with applications to energy and timber. Balancing envi- ronmental and economic values; Resources, growth, and sustainability. Special topic: the problem of global climate change. (F)

162. Economics of Water Resources. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100, or Economics 100A or 101A; 101 recommended. Urban demand for water; water supply and economic growth; water utility economics; irrigation demand; large water projects; economic impacts of surface water and institutions; economics of sanitation and waste disposal; economics of ground water management. (SP) C175. The Economics of Climate Change. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 1, International and Area Studies 106, 107, or equivalent. The course will start with a brief introduction and evaluation of the scientific aspects behind climate change. Economic models will be developed to analyze the impacts of climate change and critique existing and proposed policy tools. Specific topics studied are impacts on water resources and agriculture, economic evaluation of impacts, optimal control of greenhouse gas emissions, and the effect of treaty formation, discounting, uncertainty, irreversibility, and extreme events. Also listed as International and Area Studies C175. (F,SP) Aufhammer, Fisher

C180. Ecological Economics in Historical Context. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 100 or equivalent. Prerequisites: 100A or 101A or 101B. This course seeks to understand how economists have explored economic and environmental interactions, physical limits to growth, what constitutes the good life, and how economic justice can be assured. Yet economists continue to use measures and models that simplify these issues and promote bad outcomes. Ecological economics responds to this tension between the desire for simplicity and the multiple interdependencies needed to understand complexity in order to move toward sus- tainable, fulfilling, just economies. Also listed as Economics and Resources Group C180. (SP) Norgaard

C181. International Trade. (4) Students will receive no credit for C181 after taking Undergraduate Business Management 110S or 110T or 101B or 101A-101B. The theory of international trade and its applications to tariff protection. This course is equivalent to UGBA 118; students will not receive credit for both courses. Also listed as Economics C181. (SP) Staff

C183. Forest Ecosystem Management. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Environmental Science, Policy, and Management C183. Three hours of lecture per week. Staff

H196. Honors Research. (4) Course may be repeated for credit. Individual research or meetings with facul- try sponsor(s). Prerequisites: Upper division standing. Eligibility restrictions apply. Open only to environmental economics and resource economics and major. Supervised independent honors research specific to aspects of environmental economics and policy, followed by a oral presentation and a written report. (F,SP)

197. Field Study in Environmental Economics and Policy. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Independent study is discussed. Minimum of three hours of work per week per unit of credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised experience in off-campus organizations relevant to specific aspects of environmental economics and policy. Enrollment restrictions apply. Open to qual- ified upper division students wishing to pursue special study and directed research under the direction of a member of the staff. (F,SP)

199. Directed Group Studies for Advanced Under- graduates. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Meetings are to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected topic or topics in Environmental Economics and Policy, (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Independent studies. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Enrollment restrictions apply. Open to qualified upper division students wishing to pursue special study and directed research under the direction of a member of the staff. (F,SP)

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Agricultural and Resource Economics

Graduate Courses

201. Production, Industrial Organization, and Regulation in Agribusiness. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 201A or equivalent, or consent of instructor. Basic concepts of micro- and welfare economics; partial and general equilibrium. Industrial organization: monopolistic competition, vertical integration, price discrimination, and economics of information with applications to food retailing, cooperatives, fishing, and energy. (F)

202. Issues and Concepts in Agricultural Economics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 201A-201B or consent of instructor. History, institutions, and policies affecting agriculture markets and environmental sustainability. (F)

210. Probability and Statistics. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This is an introduction to probability theory and statistical inference. It is primarily intended to prepare students for the graduate econometrics courses 212 and 213. The emphasis of the course is on the principles of statistical reasoning. Probability is based mainly on a solid and broad ground for statistical theory and specific models will, for the most part, be considered only to illustrate the general statistical theory as it is developed. (F)

211. Mathematical Methods for Agricultural and Resource Economics. (4) Four hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. The goal of this course is to provide entering graduate students with the basic skills required to take part in the graduate program and as professional economists. The lectures place heavy emphasis on intuition, graphical representations, and conceptual understanding. Weekly problem sets provide the opportunity to master mechanical and computational techniques. Topics covered include real analysis, linear algebra, multivariable calculus, theory of static constrained optimization, and comparative statics. (F)

212. Econometrics: Multiple Equation Estimation. (4) Four hours of lectures and one hour of discussion per week. Prerequisites: 211 or consent of instructor. Introduction to the estimation and testing of economic models. Includes analysis of the general linear model, asymptotic theory of large sample methods, and the general- ized method of moments. In addition, a survey of time series analysis, limited dependent variables. Students will use computers to conduct statistical analyses. (F)

214. New Econometric and Statistical Techniques. (4) Three hours of lecture and three hours of computer laboratory per week. Prerequisites: 211 and 212 or equivalent, or consent of instructor. Standard and advanced econometric techniques are applied to topics in agriculture and resource economics. Techniques include limited dependent variables, time series analysis, and non-parametric analysis. Students will use computers to conduct statistical analyses. (F)

219A-219B. Econometric Project Workshop. (2-2) Two hours of seminar per week. Prerequisites: 210, 211, and 212, or consent of instructor. Techniques for preparing econometric studies, including finding data sources, the reporting of results, and standards for placing research questions with existing literature. With faculty guidance, students prepare approved econometric projects, present projects to the class, provide comments on other student projects, and revise projects in response to faculty and student comments. (F,SP)

232. Empirical International Trade and Investment. (2) Two hours of lecture per week for eight weeks. Prerequisites: Consent of instructor. Empirical aspects on international trade, foreign investment, and the environment. Issues related to testing various trade models. Topics include testing trade models (HO, Ricardo, Kaldor); special linkage; the role of natural resources; exchange rates and growth; trade performance and firm performance; pattern of trade; trade and the environment; and labor markets and trade. New topics in international trade such as trade models with heterogeneous firms, outsourcing, and foreign investment. (SP)

241. Economics and Policy of Production, Techn- nology, and Risk in Agricultural and Natural Resources. (3) Three hours of lecture per week. Prerequisites: 201 and 202, or Economics 201A-201B, or consent of instructor. This course covers alternative models of production, resource, and environmental risk management; family production function; adoption and diffusion; innovation and intellectual property rights; agricultural and environmental policies and their impact on production and the environment; water resources; pest control; biotechnology; and optimal control over resource. (F)

242. Quantitative Policy Analysis. (3) Three hours of lecture per week. Prerequisites: 211 or consent of instructor. Production versus predatory government behavior, rent seeking, social waste, and their trade-offs with the provision of growth-promoting public goods. Trends failure (sector); gravity models; linkages between openness and growth; trade orientation and firm performance; pattern of trade; trade and the environment; and labor markets and trade. New topics in international trade such as trade models with heterogeneous firms, outsourcing, and foreign investment. (SP)

249. Agricultural, Food, and Resource Policy Work- shop. (1) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Presentation and criticism of ongoing research by faculty, staff, and students. Not necessarily offered every semester. (F,SP)

251. Microeconomics of Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Theoretical and empirical analyses of poverty and inequality, household and community behavior, and contract and institutions in the context of developing countries. Also listed as Economics C270A. (F)

253. International Economic Development Policy. (3) Three hours of lecture per week. Prerequisites: Minimum one semester graduate-level microeconomics and statistics or consent of instructor. This course emphasizes the development and application of policy solutions to developing-world problems related to poverty, macroeconomic policy, and environmental sustainability. Methods of statistical, economic, and policy analysis are applied to a series of case studies. Students will develop practical professional skills for application in the international arena. Also listed as Public Policy C253. (F)

259. Rural Economic Development Workshop. (1) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Presentation and criticism of ongoing research by faculty, staff, and students. Not necessarily offered every semester. (F,SP)

261. Environmental and Resource Economics. (3) Three hours of lecture; Ph.D.-level economic theory or consent of instructor. Theory of renewable and nonrenewable natural resource use, with applications to forests, fisheries, energy, and climate change. Resources, growth, and sustainability. Economic theory of environmental policy. Externalities; the Coasian critique; tax incidence and anomalies; indirect taxes; the double dividend; environmental standards; environmental regulation; impact of uncer- tainty on taxes and standards; mechanism design; monitoring, penalties, and regulatory strategy; emissions markets. (F)

262. Non-market Valuation. (3) Three hours of lecture per week. Prerequisites: Ph.D.-level economic theory or consent of instructor. The economic concept of value; historical evolution of market and non-market valuation; revealed preference methods: single site demand, multi-site demand, corner solution models, and the theory of quality choice for a repeated behavior: the hedonic method; contingent valuation; other stated preference methods: ranking, choice, conjoint analy- sis; the value of life and safety; sampling and ques- tionnaire design for valuation surveys. (SP)

263. Dynamic Methods in Environmental and Resource Economics. (3) Three hours of lecture per week. Prerequisites: Ph.D.-level economic theory or consent of instructor. This course studies methods of analysis and optimal control of dynamic systems, emphasizing applications in environmental and natural resource economics. Continuous-time deter- ministic models are studied using phase plane analysis, the calculus of variations, the Maximum Prin- ciple, and dynamic programming. Numerical methods are applied to discrete time stochastic and determin- istic dynamic models. (F)

269. Natural Resource Economics Workshop. (1) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/ unsatisfactory basis. Prerequisites: Consent of instructor. Presentation and criticism of ongoing research by fac- ulty, staff, and students. Not necessarily offered every semester. (F,SP)

279. Special Study for Graduate Students. (1-6) Course may be repeated for credit. Individual study. Prerequisites: Consent of instructor. All properly qualified graduate students who wish to pursue a special field of study may do so if their proposed program of study is acceptable to the staff with whom they work. (F,SP)

299. Individual Research. (1-12) Course may be repeated for credit. Approximately four hours of research per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Gradu- ate standing and consent of instructor. (F,SP)

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. Individual study. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field director or consent of instructor. Students are expected to provide an opportunity for qualified graduate students to prepare themselves for the various examinations required for candidates of the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)

Professional Courses

300. Professional Preparation: Teaching of Envi- ronmental Economics and Policy. (1-6) Course may be repeated for credit. Four hours of work per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing, appointment as a graduate student instructor, or consent of instruc- tor. Discussion, problem review and development, guidance of discussion classes, course development, supervised practice teaching. (F,SP)

400. Professional Training in Research Methodology. (1-6) Course may be repeated for credit. Individual research. Must be taken on a satisfactory/ unsatisfactory basis. Prerequisites: Graduate student researcher appointment. Individual training for grad- uate students in planning and performing research under the supervision of a faculty adviser, intended to provide academic credit for the experience obtained while holding a research assistantship. (F,SP)
American Studies

American Studies (College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies 231 Evans Hall, (510) 642-9320
ls.berkeley.edu/ugiss/ais

Director: Christine Rosen, Ph.D.

Faculty Advisor: A list of faculty advisors is available in the major office or on the website.

Affiliated Faculty
Charles Allen (sic) (English)
Dorothea Bloom (English)
Karen Breslauer (American Studies)
Mark Brilliant (American Studies/History)
Richard Candida Smith (History)
Michael Cohen (All American Studies/American Studies)
Kathleen Donegan (English)
Robin L. Erikson (History)
Claude S. Fischer (Sociology)
Peter Gluck (Theater Studies)
Mark Goble (English)
Marcel Gonzalez (English)
Paul Girouard (Architecture)
Dorothea Hale (English)
Bob Hao (English)
David Herkin (History)
Charles Henry (American Studies)
David Hollinger (History)
Richard Huston (English)
Keren Klein (History)
Michel S. Lagnado (American Studies)
Thomas C. Leonard (Journalism)
Margaret Lovell (Art History)
Colleen Lye (History)
Waldo Martin (History)
Mary Ann Massey (Health Wellness)
†Joe McBride (Environmental Science, Policy, and Management)
Rebecca McIntosh (History)
Donald McDonald (History)
Carolyn Merchant (Environmental Science, Policy, and Management)
†Kathleen Moran (American Studies)
Louise Morris (Language Architecture)
Christopher Neu (English)
Samuel Otter (English)
George E. Owusu (History)
Christine Palmer (American Studies)
Mark Peterson (History)
Leigh Ratliff (African American Studies)
Christine Rosen (Business)
Jose Salazar (African American Studies)
Alex Saragosa (Chicago Studies)
Daniel Sargent (History)
Scott Saul (English)
†Susan M. Schweik (English)
Andrew Shanken (Architecture)
Katherine Snyder (English)
Sharon Steenwyk (American Studies)
Ann Swidler (Sociology)
Elisa Tamarik (English)
Stephen Vasey (Sociology)
Kim Vexler (American Studies)
Bryan Wagner (English)
Richard Walker (Geography)
Hertha Wong (English)

Group Major in American Studies

Established in fall 1992, the American studies major offers students the opportunity to study American society using a broad range of methods drawn from a variety of disciplines in the College of Letters and Science and the professional schools and colleges. "American society" refers primarily to the geographical regions of the United States, from pre-colonial times to the contemporary period, but recognizes that political, cultural, and economic patterns do not stop at national borders. Therefore, American studies courses will attempt to see this region within larger world systems, taking into account how the cultures of America have been continuously transformed by movements of people, commerce, and ideas that cross borders. As an interdisciplinary program, American studies draws on faculty resources and research in literature, history, economics, architecture, material culture, media studies, ethnic studies, and urban and regional studies.

Prerequisites to the Major.
In order to declare the major, students must complete two of the four lower division requirements before their Petition to Declare can be accepted.

Lower Division Requirements.
A minimum grade of C is required in all lower division courses taken for the major. Lower division requirements consist of American Studies 10, Introduction to American Studies (4 units), plus three courses from the following list of courses, with no more than two courses from any one department.

Lower Division Course List:
African American Studies 5A, 5B, 27AC, 28AC; African Studies 5; Anthropology 1, 2AC, 4AC, 8, 23AC; Asian American Studies 2A, 2B, 20A, 20B; UGBA 10, 39A; Chicano Studies 20, 40, 50, 70; Comparative Literature 60AC; Education 40AC; 75AC; English 31AC; Environmental Design 1A, 1B; Environmental Economics and Policy 1; ESPM 10, 11, 50AC, 60; Environmental Sciences 10; Ethnic Studies 10AC, 2AC, 4AC, Film and Media 25A; French 8AC; French American Studies 15B, 20, 20W, 23AC, 50AC; Geography 20, 50AC, 70AC; History 7A, 7B, 16AC, 30B; ISF 60, 61; LGBT 20AC; Letters and Science 40B; Linguistics 55AC; Media Studies 10; Muscle 26AC; Native American Studies 20, 20B, 71, 72, 90; Political Science 1, 1AC, 60AC; Psychology 14; Public Health 14; Rhetoric 41AC, 42AC; Sociology 1, 3AC, 5; Theater, Dance, and Performance Studies 25AC, 26, 52AC.

Note: This list is subject to annual review and revision.

Courses, particularly those that fulfill the American Cultures requirement, can be substituted for those on the list with adviser approval.

Transfer students should check with an advisor to have their lower division courses approved to fulfill this requirement.

Upper Division Requirements.
30-36 units distributed among the following:

(1) Core Methods Courses. (8 units) Students are required to take one course each from the two methods courses offered in U.S. Cultures in Time and Examining U.S. Cultures in Place. See department listings for available courses every semester.

(2) Area of Concentration. At least 20 units of upper division coursework drawn from the College of Letters and Science and the professional schools and colleges, in the student's individually articulated area of concentration. Areas of concentration may be highly individualized, depending on the student's intellectual topic, purpose of the prepreparation, and the availability of courses. Therefore, students planning to declare the major should meet with a faculty adviser early in their junior year, at the latest, to plan their upper division program. Subsequent to this program can be approved only with the approval of the faculty adviser.

(3) Thesis Requirement.
All majors are required to satisfy a senior thesis requirement in American studies in which they write a substantial research paper.

(4) Historical Requirement. One of the courses taken toward the major is Upper or lower division major must focus on U.S. history, culture, and/or politics before 1900. Students should check with an American studies student affairs office to ensure that the course they take meets this requirement.

Honors Program. Students who wish to be eligible to graduate with honors must enroll in American Studies H195. For admission to H195, students must have junior standing, an overall GPA of 3.5 or better. Students H195 may, with permission of the faculty, repeat the course for credit. For further information, contact the student affairs officer at 231 Evans Hall, (510) 642-9320.

Lower Division Courses

10. Introduction to American Studies. (4) Three to four hours of lecture and zero to one hour of discussion per week. Formerly Undergraduate Interdisciplinary Studies 10. American culture and cultural changes drawn from the multicultural basis of American society and emphasis on the need for multiple methods of analysis. The course will consistently draw on the arts, material culture, and various fields affecting cultural production and meaning. Those areas include literature, film, history, architecture, history of art, religion, music, engineering, environmental studies, anthropology, politics, economics, law, and medicine. This course may include discussion sections depending include literature, film, history, architecture, history of art, religion, music, engineering, environmental studies, anthropology, politics, economics, law, and medicine. This course may include discussion sections depending on available funding. Some versions of this course need four in-class contact hours because of the extensive use of media. (F,SP) Staff

10AC. Introduction to American Studies. (4) Students will receive no credit for 10AC after taking 10 or Undergraduate and Interdisciplinary Studies 10. Three to four hours of lecture and one hour of discussion per week. American culture and cultural change, with attention to the multicultural basis of American society and emphasis on the need for multiple methods of analysis. The course will consistently draw on the arts, material culture, and various fields affecting cultural production and meaning. Those areas include literature, film, history, architecture, history of art, religion, music, engineering, environmental studies, anthropology, politics, economics, law, and medicine. This course satisfies the American Cultures requirement. (F,SP) Staff

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Two to four hours of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Freshman and sophomore seminars offers students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments, and topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP)

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for two to four hours of seminar per week per unit for ten weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members across all departments on the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

98. Directed Group Study. (1-4) Course may be repeated for credit as topic varies. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Open only to freshmen and sophomores. Consent of instructor. Written proposal must be approved by sponsoring faculty. Seminars for the group study of selected topics that will vary from year to year. Topics may be initiated by students. Staff

Upper Division Courses

101. Examining U.S. Cultures in Time. (4) Course may be repeated for credit. Three to four hours of lecture and zero to one hour of discussion per week. This course examines how U.S. cultures are constructed, reinforced, and changed, and how those cultures act simultaneously at a given time. To help students develop skills in cultural analysis, lectures will contrast various methods and perspectives as they apply to the study of a particular year or decade. Topics will vary from semester to semester. This course may include discussion sections depending on available funding. Some versions of this course need four in-class contact hours because of the extensive use of media. (F,SP) Staff
on available funding. Some versions of this course require four in-class contact hours because of the extensive use of media. (F,SP) Staff

101AC. Examining U.S. Cultures in Time. (4) Course may be repeated for credit as topic varies. Three hours of lecture and two hours of discussion per week. This course examines how U.S. cultures are constructed, redefined, and changed, and how those cultures act simultaneously at a given time. To help students develop skills in cultural interpretation, the course will involve contrast various cultures and their speculations of race and class in American society. Qualitative and quantitative methods of analysis drawn from several disciplines will help students develop skills in cultural interpretation. Case studies may focus on a neighborhood, city, or region. Topics will vary from semester to semester. This course may include discussion sections depending on available funding. Some versions of this course require four in-class contact hours because of the extensive use of media. (F,SP) Staff

102. Examining U.S. Cultures in Place. (4) Course may be repeated for credit as topic varies. Three to four hours of lecture and zero to one hour of discussion per week. This course examines how U.S. cultures are constructed, redefined, and changed—particularly in reference to place and material culture. Qualitative and quantitative methods of analysis drawn from several disciplines will help students develop skills in cultural interpretation. Case studies may focus on a neighborhood, city, or region. Topics will vary from semester to semester. This course may include discussion sections depending on available funding. Some versions of this course require four in-class contact hours because of the extensive use of media. (F,SP) Staff

110. Special Topics in American Studies. (3,4) Course may be repeated for credit as topic varies. Three to four hours of lecture per week. This course is designed primarily to allow faculty to develop focused interdisciplinary courses on particular themes or problems in American society. Topics vary from semester to semester. Students should consult the department website for current offerings before registration or consultation. (F,SP) Staff

H110. Honors Seminar: Special Topics in American Studies. (3) Course may be repeated for credit as topic varies. Three to four hours of seminar per week. Prerequisites: Consent of instructor may be required. This course will introduce honorees who have achieved a minimum overall GPA of 3.3—to the history and theory of American studies as an interdisciplinary field, and to explore current themes, debates, and research problems in American studies. (F,SP) Staff

C111A. Architecture in Depression and War. (4) Course may be repeated for credit. Three to four hours of lecture and zero to one hours of discussion per week. The Great Depression and World War II are arguably the two most dramatic events for the development of the built environment in the 20th century. Not only did they alter the socioeconomic and political landscape on which architecture and urban planning depend, but they also set the stage for many of the cultural, political, and vital debates about the built environment. This course examines the 1930s and 1940s topicality, studying the work of the New Deal, corporate responses to the Depression and war, the important connections between architecture and advertising; the role of the Museum of Modern Art in the promotion of Modernism; the concept of the ideal house; and key tests, theories, and projects from the period. Also listed as Architecture C117A. (SP) Shanken

C111E. Topics in American Studies. (4) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture per week. Formerly C136. A course on the intellectual, cultural, historical, and political backgrounds to American literature. Topics will vary from semester to semester. Students should consult the department's "Announcement of Classes" for current offerings well before the start of the semester. Also listed as English C136. (F,SP)

C112A. American Cultural Landscapes, 1600 to 1900. (4) Three hours of lecture and one hour of discussion per week. Formerly C169A. Introduces ways of seeing and interpreting American histories and cultures, as revealed in everyday built surroundings—houses, homes, enclosures, stores, spaces, areas, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations, and to speculate for themselves about cultural meaning. Also listed as Environmental Design C169A and Geography C160A. (F,SP) Groth

C112B. American Cultural Landscapes, 1900 to the Present. (4) Three hours of lecture and one hour of discussion per week. Formerly C169B. Introduces ways of seeing and interpreting American histories and cultures, as revealed in everyday built surroundings—houses, homes, enclosures, recreation areas, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations, and to speculate for themselves about cultural meaning. Also listed as Environmental Design C169B and Geography C160B. (SP) Groth

C112F. The American Forest: Its Ecology, History, and Representation. (4) Three hours of lecture and one hour of discussion per week. Formerly C178B. The American forest will be examined in terms of its ecological, historical, and representations in paintings, photographs, and literary essays. This examination seeks to understand the American forest in its scientific and economic parameters, as well as the historic, social, and ideological dimensions that have contributed to the evolution of our present attitudes toward the forest. Also listed as Undergrad Interdisciplinary Studies C136, Environmental Studies C185B, History, and Environmental Studies C191. (F,SP) Lovell, McBride

C132B. Intellectual History of the United States since 1865. (4) Students will receive no credit for C132B after taking History 132B. Three hours of lecture and one hour of discussion per week. In this course, students will be introduced to the major intellectual themes, debates, and research problems in American intellectual history; both those developed specifically in the U.S. thought since the middle of the 19th century, roughly beginning with the reception of Darwin. The broader story told in the class weighs together the history of science and engineering, the arts and popular culture, philosophy, and economics. Our goal is to trace how ideas—whether they are dominant, challenging, or look back—have affected the ways in which we conduct our affairs. We will look at how intellectual history has both informed and shaped our development as a nation. Also listed as History C132B. (SP)

C134. Information Technology and Society. (4) Students will receive no credit for C134 after taking African American Studies C134. Three hours of lecture per week. This course is designed to introduce students to the role of information technology in the socialization process of every day life and to help students analyze and critique the role of technology in society. Also listed as African American Studies C134. (F,SP) Lagueure

139AC. Civil Rights and Social Movements in U.S. History. (4) Three hours of lecture and one hour of discussion per week. Beginning with the onset of World War II, America experienced not a singular, unitary Civil Rights Movement—as is typically portrayed in standard textbook accounts and the collective memory—but rather a variety of contemporaneous civil rights and related social movements. This course explores the history, presenting a top-down survey of political, legal, and cultural history (including civil and cultural history), and comparatively (by race and ethnicity as well as region) view of America’s struggles for racial equality from roughly World War II until the present. Also listed as History C139C. This course satisfies the Junior thesis requirement. (F,SP) Staff

C152. Native American Literature. (4) Three hours of lecture per week. Prerequisites: 151 is recommended but not required. An analysis of the written and oral tradition developed by Native Americans. Emphasis will be placed on a multifaceted approach—esthetic, linguistic, psychological, historical, and cultural—in examining American Indian literature. Also listed as Native American Studies C152. (F,SP) Staff

C171. The American Designed Landscape Since 1850. (3) Three hours of lecture per week. This course surveys the history of American landscape architecture since 1850 in four realms: (1) parks—squares, plazas, parks, and recreation systems; (2) urban and suburban design; (3) regional and environmental planning; and (4) gardens. The course will review the concepts and theories that have shaped and informed landscape architecture in the United States since the advent of the public parks movement, as well as the aesthetic precepts, environmental concerns, horticultural practices, and technological innovations of American designers. Students will complete a midterm, final, and a research assignment. Also listed as Landscape Architecture C171. (SP) Mozingo

C172. Business in Its Historical Environment. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Three hours of lecture per week. Prerequisites: Consent of instructor. Three hours of lecture per week. Three hours of lecture per week. This course aims to help students become conversant with the elements of alphabetic literacy and visual literacy (reading and writing) and visual literacy (observing and making) in order to develop a third distinctive textual/visual literacy. Also listed as Visual Studies C185A, Undergrad Interdisciplinary Studies C135, and English C143V. This course satisfies the American Cultures requirement. (F,SP) Staff

189. Research and Writing in American Studies. (3) Three hours of seminar per week. Prerequisites: Intended for American studies majors. This course is designed to encourage research skills, critical thinking, and effective writing. An intensive reading and research seminar, the course will assist students in the development of skills fundamental to advanced research in the humanities, social sciences, and cultural studies. In addition to examining some topics in current American studies scholarship, students will conduct semester-long research projects. The effort entails identification of research topics, cultivation of interdisciplinary methodologies, compilation of annotated bibliographies, and completion of a literature review, which may serve as the basis for the American studies senior thesis. The course is strongly recommended for those who have been out of touch with the conventions of academic research and writing and for those who are pursuing a graduate degree in the future. (F,SP) Moran, Palmer

190. Senior Thesis. (4) Individual meeting with thesis adviser. All American studies majors must satisfy the senior thesis requirement. Three options are available: (1) A3 190, Senior Thesis; (2) 191, Senior Seminar; or (3) students may (with prior faculty advisor approval) enroll in a dual division seminar appropriate to their concentration for which they write a substantial research paper. Students planning to enroll in AS 190 must complete the Thesis Agreement form (available in the department office) prior to the semester in which the thesis is written. (F,SP) Staff

191. Senior Seminar. (4) Four hours of seminar per week. Prerequisites: Declared majors with senior standing. This course will be for students who have completed a senior seminar. Students with standing as BA seniors may enroll and will be required to write individual research papers based on the general themes or issues of the seminar. The particular themes/issues will be outlined on the American studies course list provided each semester by the American studies office. (F,SP) Staff

H115. Honors Thesis. (3) Three hours of seminar per week. Prerequisites: Senior-standing major in American studies; completion of 101 and 102; 3.51 overall GPA and 3.65 GPA for classes in the major.
This is a required course for students wishing to graduate with honors in American studies. Entails writing a bachelor's thesis pertaining to the student's individual area of concentration within the American studies major. The completed thesis will be read by the thesis supervisor and one other faculty member. (F.S.P) Staff

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit as topics change. Enrollment is restricted; see the introduction to courses and curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Regulations set by College of Letters and Science; students for the group study of selected topics not covered by regularly scheduled courses. Topics will vary from semester to semester. Students must have completed 60 units in order to be eligible to enroll. (F.S.P) Staff

199. Supervised Independent Study and Research for Upper Division Majors. (1-4) Course may be repeated for credit as texts vary. Must be taken on a passed/not passed basis. Directed individual study on special topics approved by an American studies faculty member. Enrollment restrictions apply; see the introduction to Courses and Curricula section of this catalog. (F.S.P) Staff

Graduate Courses

250. Research Seminar: Selected Topics. (4) Course may be repeated for credit. Four hours of seminar per week. Prerequisites: Consent of instructor. An upper-division seminar designed to involve graduate students directly in the interdisciplinary research process. Emphasis on examination and analysis of primary sources, methodology, and the development of theoretical constructs. A major paper is required. (F.S.P) Staff

Professional Courses

300. Teaching Interdisciplinary American Studies. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This course will introduce graduate students to a number of strategies and theories used in teaching at the university level. In particular, it will focus on the challenges of teaching interdisciplinary American studies courses that rely on a range of materials from the chronological and topical approaches drawn from multiple disciplines and that address students who come from a variety of disciplinary backgrounds. (F.S.P) Staff

Ancient History and Mediterranean Archaeology (College of Letters and Science)

Group Office: 7233 Divinelle Hall, (510) 643-8741 Is.berkeley.edu/dept/ahma

Professors

David R. Malerba, Ph.D. Jewish Theological Seminary. Rabbinic literature, Talmudic culture

Stanley H. Brandes, Ph.D. University of California, Berkeley. Jewish law, history, and folklore.

David J. Cohen, Ph.D. Cambridge University. J.D. University of Chicago. Classical archaeology.

Greek law, political and legal theory

Suzana Em. Ph.D. Oxford University. History of late antiquity, early Christianity.


Ronald Hendel, Ph.D. Harvard University. Hebrew Bible.

Leslie V. J. Kutte, Ph.D. Princeton University. Greek literature.

Laurent Mayall, Ph.D. McGill University. Classical rhetoric, Roman law.

Francisca Rochberg, Ph.D. University of Chicago. Near Eastern history, history of science, ancient astrology and astronomy

Martin Schwartz, Ph.D. University of California, Berkeley.

Andrew F. Stewart, Ph.D. Cambridge University. Greek and Roman literature.

Ruth E. Tingham, Ph.D. University of Edinburgh. Old World archaeology.


Guilty Azapary (Emeritus), Ph.D.

Erich S. Gruen (Emeritus). Ph.D.

Wolfgang J. Heimpel (Emeritus), Ph.D.

J. E. Huesman (Emeritus). Ph.D.

Anne D. Klimmer (Emerita), Ph.D.

Robert C. Knapp (Emeritus). Ph.D.

Jacob Migrum (Emeritus). D.H.L.

Stephen G. L. McKenzie (Emeritus). Ph.D.

Raphael Sealey (Emeritus). M.A.

John M. Smith Jr. (Emeritus), Ph.D.

David B. Strong (Emeritus). M.A.

Ronald S. Stroud (Emeritus). Ph.D.

Leslie L. Threlkeld (Emeritus), Ph.D.

Affiliated Professors

Leslie V. Kurke, Ph.D. Princeton University. Greek literature and Mediterranean studies.

Ronald Hendel, Ph.D. Harvard University. Hebrew Bible and Mediterranean archaeology.

John K. Anderson (Emeritus), M.A., F.S.A.

J. E. Huesman (Emeritus), Ph.D.

Robert C. Knapp (Emeritus). Ph.D.

Anne D. Klimmer (Emerita), Ph.D.

Rachel Sealey (Emeritus). M.A.

John M. Smith Jr. (Emeritus), Ph.D.

David B. Strong (Emeritus). M.A.

Ronald S. Stroud (Emeritus). Ph.D.

Leslie L. Threlkeld (Emeritus), Ph.D.

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Applicants also have the option of submitting an additional writing sample (i.e., a class paper, senior thesis, honors thesis, M.A. thesis). An applicant with an M.A. degree in a relevant field of study (such as Classics, Near Eastern Studies, History, or History of Art) that has spent at least one year of undergraduate work in ancient history, ancient Near Eastern archaeology, or related fields. Applicants primarily interested in the Greek and Roman worlds should be prepared to undertake advanced work in either Greek or Latin and its culture, and also should have basic competence in the second of these two languages. Applicants primarily interested in the ancient Near East do not have to display competence in one of the area's ancient languages before applying but to do so may strengthen their application considerably.

Students who have already acquired the M.A. degree in a relevant field are especially encouraged to apply, and will be considered for direct admission to the Ph.D. program. The AHMA faculty as a group approves all applicants for admission. AHMA policy is to limit enrollment to the number of students who can be supervised by the faculty members for the first five years of their graduate career. Although AHMA receives around 50 applications per year, its admission quota (set by Graduate Division) is currently around 5-6, with the expectation that 2-3 new students will enroll each fall. Competition therefore is extremely keen. As a result, while some applicants may be rejected for lack of preparation or for undistinguished academic records, a substantial number who are capable of doing good graduate work unfortunately also must be denied admission.

The AHMA faculty judges and ranks applicants on a combination of criteria that includes: (1) preparation to undertake advanced scholarship work; (2) academic distinction as reflected in overall GPA, major GPA, and junior and senior year GPA, as well as awards, prizes, or publications; (3) a minimum of three letters of recommendation; (4) GRE scores (use 2001: Classics, or 2600: Classical Languages for scores to be reported by ETS); (5) a statement of purpose, clearly and cogently written, that indicates why the applicant is interested in the AHMA program and where his or her specialization might lie; and (6) a scholarly writing sample of no more than 25 pages, indicating the origin of the writing sample (i.e., senior honors thesis, M.A. thesis). An applicant with an M.A. is expected to offer substantially stronger preparation than one with only a B.A. Applications must be submitted electronically via the Grad Division’s online application at grad.berkeley.edu/prospective or via the link on the AHMA website. The online application process for fall normally opens in early September.

The deadline for all online applications is December 15th. We request that applicants mail all their supplemental material, such as all official transcripts, writing samples, applicant Reading List in Ancient Languages, or any other material, as soon as possible after submitting their online application. They will then be manually uploaded by the admissions staff into the applicant’s online application. Additionally, a second hard copy of all official transcripts must also be sent directly to the Graduate Group in Ancient History and Mediterranean Archaeology, Attn. Graduate Admissions, University of California, Berkeley, 7233 Divinelle Hall #2600, Berkeley, CA 94720-6000. Transcripts and letters of reference must be received within a week after the December 15 deadline to receive proper consideration. Material sent to the Graduate Division after December 15th, sometimes for so long that the AHMA faculty will be forced to discard the application as incomplete.

Note: Applicants also have the option of submitting the required Applicant’s Reading List in Ancient

R prefix=course satisfies R&RE requirement

W prefix=online course

*Professor of the Graduate School

†Recipient of Distinguished Teaching Award
Languages by filling out the electronic form available here. Applicants must submit a list of three contacts for letters of recommendation during the online application. These recommenders will be contacted by email to submit their recommendations online. We strongly urge you to request the letters of recommendation from your recommenders at the time of submitting your online application. The Berkeley campus has a commitment to increasing the diversity of its graduate student population. The AHMA program strongly encourages applications from members of underrepresented groups, such as U.S. or residents of African American, Hispanic, Asian American, or Native American descent, who are qualified to pursue interdisciplinary graduate work in areas covered by the program.

General Information. The AHMA program is housed on the seventh floor of Dwinelle Hall in an administrative cluster known as CASMA. CASMA comprises the Departments of Classics and South and Southeast Asian Studies, and the graduate study program in Medieval Studies as well as AHMA. Dwinelle Hall facilities available to our students include a student lounge, a coffee shop, the Nemea/Sardis Archives, the Sara B. Aleshire Center for Greek Epigraphy, the Center for the Tebtunis Papyri, GSI offices, and a dedicated office for research equipment and computers. The office provides a break-out (every student has a mail slot), copying, advising, and consulting. Some program specifics are provided below. Further details are available in the AHMA Graduate Student Handbook or from the student affairs officer.

Advising. There is a three-tiered advisory system for AHMA students. The student affairs officer counsels students on campus policies, regulations and procedures, helps monitor students’ degree progress, and assists students with bureaucratic problems related to the completion of degree requirements. A graduate advisor takes responsibility for general academic counseling, offers suggestions on programs of study and advisory committees, and supervises students’ academic progress. Direct supervision of each student’s academic progress is conducted by a faculty advisory committee selected by the student in accordance with his or her areas of interest. Committee members meet with the student to recommend a suitable program of study and help determine his or her major and minor fields. The committee also periodically reviews the student’s progress.

Coursework and Requirements. There is no prescheduled course of study for the AHMA program and work is tailored to suit the interests and goals of the individual student. Recommendations for particular courses are generally made by the student in accordance with his or her areas of interest. Recommendations for AHMA students are also made by the committee. These recommendations are reviewed during the second year of study by the student and his or her advisor. Financial aid may also take the form of research assistantships (teaching assistantships) right through to the Ph.D., provided they make good progress. Applicants are strongly encouraged to also apply to external programs for funding, such as the Mellon Fellowship Program, Danforth Foundation, and Javits Fellowship Program. Your undergraduate institution and home department should be able to provide information about these programs.

Available awards for continuing students include resident fellowships, traveling fellowships, extramural fellowships, and additional graduate awards for AHMA students. Students in the Group are also urged to compete for graduate student instructorships in a number of different departments, including Classics, History, Near Eastern Studies, and South and Southeast Asian Studies as well as in programs such as Religious Studies or Undergraduate and Interdisciplinary Studies. Graduate student instructorships are rarely awarded in the first year of graduate study.

Stage I of the Ph.D. Program. The M.A. Degree. Requirements for Stage I include: (1) successful completion of a minimum of eight courses, including a methodology course in the area of the student’s main field of interest and an interdisciplinary AHMA seminar team-taught by faculty from two different departments; (2) the achievement of competence in one ancient and one modern language; (3) successful completion of a third semester written examination, which may be turned into an M.A. thesis if the student wishes.

Stage II of the Ph.D. Program and the Ph.D. Degree. Requirements for the Stage II include: (1) successful completion of a minimum of eight courses (of which up to three may be courses taken at Stage I level) in one major field of study, one minor field, and one outside field, normally distributed in a 4:2:2 ratio; (2) a three-hour written examination in the major field; (3) competence in a second ancient language and reading ability in at least two modern languages; (4) a dissertation prospec- tus and consultation with the student’s advisory committee; (5) successful completion of the Ph.D. Oral Qualifying Examination; (6) fieldwork experience; and (7) successful completion of a dissertation. The student shall present and complete all the qualifying examinations (including the oral) within five years after admission to the program and two and a half years after completing Stage I. To accommodate individual student pro- grams, AHMA is flexible in its requirement for both major and minor fields, which the student selects in consultation with his or her advisory committee. These fields should be distributed across the geographical and disciplinary areas covered by the AHMA program (the Ancient Near East and Egypt, Greece, and Rome; archaeology, history, art history, and so on). So, for example, students whose major field is in the Greco-Roman world should choose an outside field in Pharaonic Egypt and/or the Ancient Near East, and vice versa. Students whose major field is text-based must choose a minor field in the material culture of that field (excluding epigraphy and papyrology), and vice versa.

Each AHMA student is also expected to acquire practical experience in archaeology and material culture, broadly defined. This experience may be obtained in a number of ways: (1) through participation in excavations, such as AHMA sponsored projects like those at Nemea and Mycenae in Greece, Dhiban in Jordan, El-Hibeh in Egypt, or Akrotiri in the Cyclades; (2) through field and/or other on-site work, such as that sponsored by AHMA at Pompeii; (3) through enrollment in approved study abroad programs (e.g., at the American Academy in Rome, the American University in Cairo, or the American Academy in Rome); or (5) through supervised research projects conducted at approved museums or research institutions, such as the Academic Museum at the Hebrew University, the Getty Center and Museum, the Albright Institute of Archaeology in Jerusalem, the Cyprus American Research Institute, the American Research Center in Egypt, or the American Center for Oriental Research in Amman. In the interests of broadening the student’s experience, this dimension of the program must be fulfilled by the end of Stage I.

Upon completion of all qualifying exams and all requirements, the student is admitted to candidate status for the Ph.D. He or she then proceeds to select a dissertation topic and a committee of three faculty members from at least two different depart- ments who will guide the research and writing. The committee member most closely involved with the student’s research is usually named as chair.

Graduate Courses

210. Ancient History and Mediterranean Archaeology Interdisciplinary Seminar. (2,4) Course may be repeated for credit. Three hours per week.

Prerequisites: Graduate standing. Team-taught by faculty from two different departments. The purpose is not only to expose students to a discipline other than their own, but to engage them directly in the application of that discipline to their own research interests. The topic and instructors will vary from year to year. Staff

299. Special Study. (1-4) Course may be repeated for credit. Four hours of independent study per week per unit, including consultation. Prerequisites: Graduate standing. Consent of instructor and/or student instructorships are rarely awarded in the first year of graduate study. Special individual study for qualified graduate students. Individual study and research, including archaeological fieldwork or laboratory projects, in any area at any level, subject to approval by the departmental chair. Students may register for credit in any subject matter not covered in scheduled course offerings. (F,SP) Staff

Anthropology

(College of Letters and Science)

Department Office: 232 Kroeber Hall, (510) 642-3391
http://anthropology.berkeley.edu

Professors

Everton H. Blum, Ph.D. University of California, Berkeley. Biological anthropology, human culturalecology, behavioral evolution

William C. Ditmars, Ph.D. (Distinguished Chair in Linguistic Anthropology). Ph.D. University of Chicago. Maya culture, language in culture, discourse analysis, communication, shamanism, the logic of anthropological inquiry, anthropology of literature.

Christine Hastorf, Ph.D. University of California, Los Angeles. Archaeology, food and agriculture, political economy, gender, paleoenvironmental analysis.

James Holston, Ph.D. Yale University. Cities and citizenship; political theory, democracy, and law; planning and architecture; urban ethnography; Brazil, the Americas.

Rosemary Joyce (The Richard and Rhoda Goldman Distinguished Professor in the Social Sciences; Chair, Department of Anthropology). Ph.D. University of Illinois, Urbana. Settlement patterns, symbolism, complex societies, ceramics, Central America


Kent G. Lightfoot, Ph.D. Arizona State University. North American archaeology, coastal hunter-gatherers

Xin Lin, Ph.D. University of California, Davis. Indigenous theory, transformation of rural society, social change and resistance, China and East Asia.

Laura Nader, Ph.D. Radcliffe/Harvard University. Mexico, Middle East. Ethnographic fieldwork, oral history of social thought, genomics

Nancy Scheper-Hughes, Ph.D. (Distinguished Professor of Anthropology). Ph.D. University of California, Berkeley. Medical, psychological, Europe, Brazil

Steve Sillars, Ph.D. Harvard University. Urban development, Middle East.

Paul M. Rabinow (The Robert H. Lowie Distinguished Chair in Anthropology, professor, postdoc, Berkeley).

Barbara C. Sussman, Ph.D. University of Michigan. History of science, gender and geography.

James N. Anderson (Emeritus), Ph.D.
Stefania Pandolfo, Ph.D.
Corinne (Cori) P. Hayden, Ph.D.
Associate Professors
Paul Rabinow, Ph.D.
Charles L. Briggs, Ph.D.
Stanley H. Brandes, Ph.D.
Professors
Affiliated Researchers
Timothy White, Ph.D. Physical anthropology, evolutionary
David Szanton, Ph.D.
Carol Stack, Ph.D. Social anthropology, comparative family
Clara Mantini-Briggs, Ph.D.
Jennifer Johnson-Hanks, Ph.D. Social organization,
Susan Ervin-Tripp, Ph.D. Sociolinguistics, child language
Philippe Bourgois, Ph.D. Medical anthropology
Sabrina Agarwal, Ph.D. University of Toronto.
Charles Hirschkind, Ph.D. Johns Hopkins University.
Corinne (Cori) P. Hayden, Ph.D. University of California,
Mariane Ferme, Ph.D. University of Chicago. Social/cultural
Lawrence Cohen, Ph.D. Harvard University. Medical
Associate Professors
Vincent M. Sarich
Jack M. Potter
Eugene A. Hammel
John J. Gumperz
John A. Graham

Department Overview
The Department of Anthropology offers students the opportunity to study humankind from the broadest perspective. Courses in the department offer knowledge of social and cultural aspects of behavior as well as the physical nature of humans. Lower division courses are intended to give a basic understanding of human evolution, prehistory, and the nature of human cultures, while upper division courses elaborate particular themes.

The anthropology major is designed to serve two purposes: (1) to provide a general education in anthropology for students who are pursuing a liberal arts education and (2) to provide preparation for graduate work for students who wish to become professional anthropologists. Students who do not intend to do graduate work in anthropology may plan their program with considerable freedom, so long as they fulfill the requirements of the major listed below. Students who plan to go on to graduate study, either at Berkeley or at another institution, should design a combination of courses to form a unified plan of study that meets special intellectual interests.

The collections and research facilities of the Phoebe A. Hearst Museum of Anthropology are available for study in anthropology, ethnography, physical anthropology, and related subjects by graduate and undergraduate students, and visiting scholars; the museum’s exhibition hall is used for instructional and educational purposes, particularly in connection with coursework. Those interested may contact the director at 103 Kroeber Hall. For further information on the Hearst Museum, see the index of this catalog.

The Anthropology Library, 230 Kroeber Hall, is part of the university system. It contains nearly 70,000 bound volumes and receives 965 current serial titles. The Anthropology Library houses a large reading room and facilities for reading microfilm. It is open to all members of the University but specifically to the faculty and students of the Department of Anthropology.

Students seeking information on the Undergraduate Program may inquire at 209 Kroeber Hall. Students seeking information on the Graduate Program may inquire at 205 Kroeber Hall.

The Major
Lower Division Prerequisites (3 total): Anthropology 1, 2 or 2AC, and 3 or 3AC. The three lower division prerequisites may be taken in any order.

Upper Division Requirements (9 total):
• Anthropology 114: History of Anthropological Thought;
• One course in biological anthropology (choose from Anthropology 100-112, 127A, 127B);
• One course in archaeology (choose from Anthropology 121-136J, 174AC);
• One course in social/cultural anthropology (choose from Anthropology 115-119, 138-189A);
• Five anthropology electives (choose five from Anthropology 100-196).

The nine required upper division courses listed above must include at least one Area course and one Method course:
• Area courses: 121-125B, 128A, 147C, 170-188, 189A;

Courses taken to satisfy the Area and Method requirements must satisfy one of the nine required courses. For example, taking Anthropology 189A will satisfy both the Area requirement and one of the five electives; Anthropology 132A would satisfy both the Method and the Archaeology Core.

All courses taken to satisfy the major requirements must be taken on a letter-grade basis.

Students wishing to pursue a Ph.D. in anthropology should consider taking their five elective requirements. (This concentration would not be noted on the transcript or diploma.) Faculty advisers are available to meet with students who have questions on how best to prepare for graduate work in anthropology. See the undergraduate adviser in 209 Kroeber for a referral to one of the faculty undergraduate advisers.

A minimum GPA of 2.0 must be maintained in the lower and upper division anthropology courses.

Lower division courses may be completed in any order. Start with the course that seems most interesting to you. Note: Anthropology 1 is offered once a year (either fall or spring) and during summer. Anthropology 2 and 3 are offered during both fall and spring semesters each year, and during the summer. Anthropology 114 is only offered in the spring and should be taken no later than the spring of junior year.

Study Abroad. A maximum of four courses taken abroad, including those of the Education Abroad Program of the University of California, may be used to meet upper-division major requirements. Submit a Course Substitution petition and a detailed syllabus for each class you’d like evaluated to the undergraduate adviser in 209 Kroeber. Note: A course description alone is not sufficient for evaluation; a syllabus is always required for course evaluation.

Honors Program. The Honors Program in anthropology is an independently pursued course of research undertaken by qualified students under the mentorship of a faculty thesis adviser. A GPA of 3.3 overall, and 3.5 in the major in courses completed at Berkeley is required to qualify for the program. A year-long senior program, it may begin in either the fall or spring semester. The program requires the sponsorship of an anthropology professor as thesis adviser and a second reader. The honors courses, H195A and H195B, may also count as elective requirements for the major. Applications and more information are available at 209 Kroeber.

Preparation for Graduate Study
Admission to graduate study at Berkeley does not presuppose a B.A. in anthropology. The graduate program is oriented toward the doctorate, and only candidates for the Ph.D. will be accepted. The M.A. degree is awarded in the course of study leading to the doctorate.

Because of the number of students who wish advanced training, only a small percentage of applicants can be accepted. Applications are considered only once a year for the following fall semester. The deadline for application is December 15.

Graduate Programs
Anthropology Ph.D. Program
The Department of Anthropology offers a Ph.D. in anthropology, with the subdisciplines of social-cultural anthropology or archaeology. The Ph.D. in anthropology is concerned with diverse analytic and methodological approaches to contemporary world and includes research sites across the United States and around the world. For example, the Ph.D. in anthropology might focus on globalization and political economy; gender and feminist analysis in archaeology and social-cultural
accompanied by seminars that explore pain, suffering, madness, and other human afflictions as in bioevolutionary dimensions of disease are to medicine and the biological sciences. Courses of relevance to the social sciences as well as concerned with questions of both theoretical from sociocultural, psychological, biological, bio-medical anthropology participates in anthropology of both campuses.

Students undertake research for the Ph.D. dissertation under a three-person committee in charge of their research and dissertation. Students do original field, laboratory, or library research. After an examination, a minimum of one year. The students then write the dissertation based on the results of this research. On completion of the research and approval of the dissertation by the committee, the students are awarded the doctorate.

Medical Anthropology Ph.D. Program

General Information. The Department of Anthropology of the University of California, Berkeley, and the Graduate Group in Anthropology at the University of California, San Francisco currently offer a joint Ph.D. in medical anthropology. Students may apply to enter the program through either the Berkeley or the San Francisco campus but not both. The point of entry determines the student’s home base during the program. Financial aid, primary advising, and other routine services are provided by the campus through which the student enters the program. All students, however, benefit from seminars and coursework on both campuses and by the participation of the faculty on both sides of the program on all qualifying examinations and on the doctoral dissertation committee.

Medical Anthropology. Medical anthropology entails the exploration of humans as simultaneously physical and symbolic beings in both contemporary and evolutionary contexts. As such, medical anthropology participates in anthropology as a whole, encompassing theory and practice from sociocultural, psychological, biological, biocultural, symbolic, and linguistic anthropology. It is concerned with questions of both theoretical and applied significance, and with research that is of relevance to the social sciences as well as to medicine and the biological sciences. Courses in bioevolutionary dimensions of disease are accompanied by seminars that explore pain, suffering, madness, and other human afflictions as a social language speaking to the critically sensitive or contradictory aspects of culture and social relations. Anthropological epidemiology asks the questions, “Who gets sick with what ailments?” (differential risks, forms of medical knowledge, and medical behavior) and “Why?” (what social arrangements, cultural features, and biotechno-environmental forces account for these risks). Medical anthropology interprets individuals as actively constructing their medical realities and not simply adjusting to or coping with them.

Applications to all graduate programs are considered once each year for the following fall semester. The application period opens in early September, and the deadline for receipt of both department and Graduate Division applications is December 15. Applications are screened by the Anthropology faculty, and selections are made on the basis of academic excellence, letters of recommendation, GRE scores, relevant experience, and a strong statement of intellectual and professional purpose.

The minimum requirement for admission to the Berkeley doctoral program in anthropology and in medical anthropology is a B.A. The UC San Francisco program in medical anthropology requires a master’s degree in anthropology or a related discipline, or a postbaccalaureate professional degree.

Master of Arts in Folklore

The folklore program is designed to provide graduate students with a competent knowledge of both the materials of folklore and the various methods of studying these materials.

For information, see the Folklore section of this catalog.

Lower Division Courses

1. Introduction to Biological Anthropology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Physical and behavioral adaptations of humans and their prehistoric and living relatives. Issues in evolutionary theory, molecular evolution, primate behavior, interpretation of fossils and ancient activities, racial differences, and genetic components of behavior are defined and evaluated. (SP)

2. Introduction to Archaeology. (4) Students will receive no credit for 2 after taking 2AC but may remove a deficient grade. Three hours of lecture and one hour of discussion per week. Prehistory and cultural growth. Introduction to the methods, goals, and theoretical concepts of archaeology with attention to the impact archaeology has had on the construction of the histories of diverse communities—Native Americans, Hispanics, and Afro-Americans. (SP)

2AC. Introduction to Archaeology. (4) Students will receive no credit for 2AC after taking 2 but may remove a deficient grade. Three hours of lecture and one hour of discussion per week. Prehistory and cultural growth. Introduction to the methods, goals, and theoretical concepts of archaeology with attention to the impact archaeology has had on the construction of the histories of diverse communities—Native Americans, Hispanics, and Afro-Americans. (SP)

3. Introduction to Social and Cultural Anthropology. (4) Students will receive no credit for 3 after taking 3AC. Deficient grade in 3 may be removed by taking 3AC and one hour of discussion per week. The structure and dynamics of human culture and social institutions. (SP)
102L. Physical Anthropology Laboratory. (1-3) Six hours of laboratory per week. Prerequisites: 100 or 101 or 105. Descriptive and analytical techniques and methods applicable to the study of intra- and inter-group biological variation. (F,SP)

103. Introduction to Human Osteology. (6) Six hours of lecture and 14 hours of laboratory per week. Prerequisites: 1 and Biology 1B. An intensive study of the human skeleton, reconstruction of individual and group characters, emphasizing methodological and analytical approaches and the evolution of human populations from archaeological and paleontological contexts, taphonomy, and paleopathology. Also listed as Integrative Biology C142L. Offered alternate years. (SP) White

105. Primate Evolution. (4) Three hours of lecture per week. Prerequisites: 1 recommended. A consideration of the major groups of primates with an emphasis on the evolution of behavior. (F,SP)

106. Primate Behavior. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or Biology 32 recommended. Humans, apes, and selected monkeys are the primates of concern, and among this array patterns and degrees of social behavior vary greatly. Lectures present a general introduction to primate socioecology in the context of the relationship of biology and behavior from an evolutionary perspective, and an examination of the roots of modern human behavior. (F,SP)

111. Evolution of Human Behavior. (4) Three hours of lecture per week. This course will ask to what extent human behavior varies within individual, group, social, and cultural dimensions can be understood using the relatively small number of basic principles provided by evolutionary biological considerations. (F,SP)

112. Special Topics in Biological Anthropology. (4) Course may be repeated for credit. Three hours of lecture per week and one or more hours of laboratory per week. Prerequisites: Anthropology 1 recommended. Varying topics covering current discoveries, research, theories, fieldwork, etc., in biological anthropology. Topics vary with instructor. (F,SP)

114. History of Anthropological Thought. (4) Three hours of lecture and one hour of discussion per week. Formerly 111A. This course will present a history of anthropological thought from the mid-19th century to the present, in light of major advances in the subdisciplines of anthropology. It will focus both upon the integration of the anthropological subdisciplines and upon the relationships between these and other disciplines outside anthropology. (SP)

115. Introduction to Medical Anthropology. (4) Three hours of lecture and one hour of discussion per week. Cultural, psychological, and biological aspects of the definitions, causes, symptoms, and treatment of illness. Comparative study of medical practices, including historical and cultural factors. (F,SP)

119. Special Topics in Medical Anthropology. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status and consent of instructor. Special topics in cultural, biological, and historical approaches to medical anthropology. (F,SP)

121. Historical Archaeology. Archaeology of the period from the first European settlement in America, Australasia, South Africa, etc. The following series of 121. Historical Archaeology, sequence courses may be taken in any order.

121AC. American Material Culture. (4) Students will receive no credit for 121AC after taking 121A. Three hours of lecture per week. Prerequisites: 2 or consent of instructor. Patterns in material culture as it reflects behavioral and psychological aspects of American culture since the 17th century. Topics include architecture, domestic artifacts, mortuary art, foodways, and trash disposal. This course satisfies the American Cultures requirement. (F,SP)

121C. Historical Artifact Identification and Analysis. (2) Two hours of lecture and three hours of laboratory per week. Prerequisites: 121A, 121AC, or 121B recommended and consent of instructor. Learn to work with historical artifacts from the stage of recovery through to the final deposition. The course will focus on the analysis of materials (i.e., ceramic, glass, metal, bone, shell artifacts) recovered from historic sites. Skills acquired include how to identify, date, and interpret historic artifacts. Also listed as Anthropological Archaeology. (F,SP)

122. Archaeology of the Americas. Three hours of lecture per week. Prerequisites: 2. A group of courses that examine the native societies and cultures of the Americas in the past, as known from a variety of sources used by archaeologists, including study of material culture, documents, visual culture, and the use of ethnographic accounts. (F,SP)

123. Old World Cultures. Three hours of lecture per week. Prerequisites: 2. A variety of courses that consider the peoples and past cultures and societies of the Old World, from 1800 to the present day. Topics include the Near East, the Mediterranean, the Americas, the African continent and insular ecosystems, and the reciprocal effects of anthropogenic change on human cultures. Also listed as Integrative Biology C187. (F,SP) White

123C. Archaeology of Europe. (4) Prerequisites: 2. Formerly 127. Selected topics and research problems in the archaeology of the Pleistocene and/or post-Pleistocene of Europe. (F,SP)

123F. Special Topics in Near Eastern Archaeology: Explorers, Archivists, and Tourists in the Contemporary Middle East. (3) Three hours of lecture per week. Prerequisites: Near Eastern Studies 10, 15, or 18 recommended. This course examines the roles that Near Eastern archaeologists played within the context of recent Middle Eastern history and society, from 1800 to the present day. Topics include the discipline's entanglement with imperialism, nationalism, science, trade, media, and war. Students will examine and discuss ethnographies, technical reports, memoirs, films, and images. Also listed as Near Eastern Studies C119. (F,SP) Porter

124. Pacific Cultures. Three hours of lecture per week. Prerequisites: 2. A variety of courses that consider the peoples and past cultures and societies of Oceania and the Pacific, through the study of archaeology, ethnography, ethnohistory, and other relevant fields. No specific sequence of courses; students may take any or all of the following in any sequence. (F,SP)

124A. Archaeology of the South Pacific. (4) Selected topics and research problems in the archaeology of the southern Pacific from prehistory through to the establishment of complex chiefdoms in many locales. Stress on current issues and interpretations. (F,SP)

124AC. Hawaiian Ethnohistory. (4) Three hours of lecture per week. Prerequisites: 1 or Biological Anthropology 185R or consent of instructor. Developmental foundations of the 20th-century multicultural society of Hawaii, during the period 1778-1900, explored through an explicitly anthropological perspective. Students are advised to take any or all of the following in any sequence. (F,SP)

124C. African Material Culture. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 187. A deficient grade in 187 may be removed by taking 124C and/or Integrative Biology C187. Three hours of lecture per week. Prerequisites: 1 or Biology 1B, or consent of instructor. This course examines the history of human dispersal across Oceania from the perspectives of biogeography and evolutionary ecology. Hawaii’s sapiens faced problems of dispersal, colonization, and extinction, and adapted in a variety of ways to the diversity of insular ecosystems. A dual evolutionary model takes into account cultural evolution and transmission as well as biological evolution of human populations. This course also explores the cultural impacts of human populations and fragile insular ecosystems, and the reciprocal effects of anthropogenic change on human cultures. Also listed as Integrative Biology C187. (F,SP) Kirch

125. Asian Archaeology. Three hours of lecture per week. Courses focus on past Asian peoples, culture, and societies through the study of archaeology, ethnography, and other relevant fields. These courses meet the Area requirement and may be taken in any sequence. (F,SP)

125A. Archaeology of East Asia. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 129B. Geochronological and prehistoric archaeology in China, Japan, and Korea. Also listed as Japanese C175. (F,SP)

125B. Archaeology and Japanese Identities. (4) Students will receive no credit for 125B after taking 125. Three hours of lecture per week. Formerly Archaeology 125B. Geochronological and prehistoric archaeology in China, Japan, and Korea. Also listed as Japanese C176. (F,SP)

127. Bioarchaeology. Two hours of lecture and four hours of laboratory per week. Prerequisites: 2 or consent of instructor. Parts of the human skeleton are studied to help understand biological and cultural change in human populations. The focus is on the analysis of human skeletons from archaeological assemblages. (F,SP)
1, Biology 1B. A variety of courses related to bioarchaeology. (F,SP)

127A. Introduction to Skeletal Biology and Bioarchaeology. (4) Students will receive no credit for 127A after taking either C103 or Integrative Biology C142. An introduction to skeletal biology and archaeology major classes of plant remains likely to be encountered in hunter-gatherer subsistence, settlement, mortuary/ceremonial practices and crafts/trade; social archaeology of hunter-gatherers including studies of gender, cognition, and cultural landscapes; and discussions as to where hunter-gatherer studies fit in the context of world archaeology. (F,SP)

C129D. Holocene Paleoeconomy: How Humans Changed the Earth. (3) Students will receive no credit for Anthropology C129D/Integrative Biology C155 after taking Anthropology 129D or Integrative Biology 155. A deficient grade in Anthropology 129D or Integrative Biology 155 may be removed by taking Anthropology C129D/Integrative Biology C155. Three hours of lecture per week. Prerequisites: Either 2 or Biology 1A. Since the end of the Pleistocene and especially with the development of agriculturally based societies humans have had cumulative and often irreversible impacts on natural landscapes and biotic resources worldwide. Thus "global change" and the biodiversity crisis are not exclusively developments of the industrial and post-industrial world. This course uses a multidisciplinary approach, drawing upon methods and data from anthropology, ecology, paleoecology, paleoecology, paleontology, and historical ecology to unravel the broad trends of human ecodynamics over the past 10,000 years. Also listed as Letters and Science C140U. (F,SP)

130. History and Theory of Archaeology. (4) Three hours of lecture per week. Prerequisites: 2. Formerly 136. A critical review of the historical background and philosophical premises of past and present anthropological theory with respect to its concepts of time and change. (F,SP)

C131. Geoarchaeological Science. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 2 or Earth and Planetary Science 50, or consent of instructor. Formerly 131. This survey and laboratory course will cover a broad range of current scientific techniques used in the technical and theoretical analysis of geoarchaeological materials. The course includes field and laboratory studies in analytical chemistry, geology, petrology/petrography, and a survey of dating materials in archaeology, the historical development of geoarchaeological science, and other aspects of archaeological science applied to geoarchaeological materials. Also listed as Earth and Planetary Science C171. (F,SP)

132. Analysis of Archaeological Materials. Three hours of lecture and three hours of laboratory per week. Prerequisites: 2 or consent of instructor. Principles of analysis of inorganic archaeological materials, including ceramics, metals, wood, textiles, and metals, with laboratory instruction. These courses meet the Method requirement for the major and may be taken in any sequence. (F,SP)

132A. Analysis of Archaeological Ceramics. (4) Discussion of and laboratory instruction in methods of analysis of ceramics used by archaeologists to establish a time scale; document interconnections between different areas, sites, or groups of people; suggest what activities were carried out at particular sites; and understand the organization of ceramic production itself. (F,SP)

132B. Analysis of Archaeological Materials. Three hours of lecture and one hour of discussion per week. Prerequisites: 2; or 3 or for 129A,. These courses explore contemporary topics in archaeology that transcend time periods or cultural areas. Courses may be taken in any sequence. (F,SP)

129A. Prehistoric Art. (4) Draws on study of art in non-literate societies and on archaeology to explore a range of prehistoric arts in cultural contexts, e.g., rock art, Ice Age art, Ice Age ceramics. Uses illustrative materials from the Hearst Museum. (F,SP)

129B. Archaeology of Hunter-Gatherers. (4) Course may be repeated for credit. Three hours of lecture and three hours of laboratory per week. Prerequisites: 2 recommended. Special topics in archaeology that meet the Area requirement for the anthropology major. (F,SP)

129. Topical Areas in Archaeology. Three hours of lecture per week. Prerequisites: 2; (2 or 3 for 129A). These courses explore contemporary topics in archaeology that transcend time periods or cultural areas. Courses may be taken in any sequence. (F,SP)

129A. Prehistoric Art. (4) Draws on study of art in non-literate societies and on archaeology to explore a range of prehistoric arts in cultural contexts, e.g., rock art, Ice Age art, Ice Age ceramics. Uses illustrative materials from the Hearst Museum. (F,SP)

129C. Archaeology of Hunter-Gatherers. (4) Course may provide an overview of hunter-gatherer archaeology, focusing on the history of hunter-gatherer archaeology in North America, the history of methods used in hunter-gatherer subsistence, settlement, mortuary/ceremonial practices and crafts/trade; social archaeology of hunter-gatherers including studies of gender, cognition, and cultural landscapes; and discussions as to where hunter-gatherer studies fit in the context of world archaeology. (F,SP)

129D. Holocene Paleoeconomy: How Humans Changed the Earth. (3) Students will receive no credit for Anthropology C129D/Integrative Biology C155 after taking Anthropology 129D or Integrative Biology 155. A deficient grade in Anthropology 129D or Integrative Biology 155 may be removed by taking Anthropology C129D/Integrative Biology C155. Three hours of lecture per week. Prerequisites: Either 2 or Biology 1A. Since the end of the Pleistocene and especially with the development of agriculturally based societies humans have had cumulative and often irreversible impacts on natural landscapes and biotic resources worldwide. Thus "global change" and the biodiversity crisis are not exclusively developments of the industrial and post-industrial world. This course uses a multidisciplinary approach, drawing upon methods and data from anthropology, ecology, paleoecology, paleontology, and historical ecology to unravel the broad trends of human ecodynamics over the past 10,000 years. Also listed as Letters and Science C140U. (F,SP)

136. Public Anthropology. Three hours of lecture per week. A variety of courses that introduce principles in the public aspects of anthropology. These courses may be taken in any order. (F,SP)

136A. Museum Exhibit Curation and Design. (4) Three hours of lecture and four hours of studio per week. A practical introduction to contemporary museum approaches to exhibition design, with particular application to the design of exhibits in cultural heritage in anthropology, art, and natural history museums. Both the theory of museum exhibit design and practice will be covered, including critiques of representations of cultural heritage; conversations about education, and remains as an incorporation of interactivity, including through digital media. (F,SP)

136B. Museum Methods. (4) This course will introduce participants to the fundamentals of contemporary museum practices. It is intended for two groups of students: (1) individuals who may be thinking of conducting research in museums and may benefit from an understanding of the way these institutions work; and (2) individuals who may be considering a career as a post-graduate career. The course will include both discussion of museum concepts and practical application of these concepts through real-world exercises. This course outlines a digital documentation strategy for collecting, processing, and integrating digital data from a variety of different media into a dataset that holistically describes place, including landscape, architecture, and other cultural artifacts. (F,SP)

136C. Multimedia Authoring, Part 1. (4) One hour of lecture and four hours of laboratory per week. This course is the first part in a two-part series of courses that introduce students in research and presentation of archaeological information through nonlinear multimodal authoring. The content of the course varies and may focus on an area or a topic depending on instructor. Students experience the first stage of multimedia authoring process: research, planning, and design. The focus is on content development and evaluation of digital research sources, with an introduction to software skills and practice. (F,SP)

136D. Digital Documentation and Representation of Cultural Heritage. (4) One hour of lecture and four hours of laboratory per week. A practical, hands-on overview of cutting-edge digital technology that is being used and developed for the documentation of archaeological sites. This course outlines a digital documentation strategy for collecting, processing, and integrating digital data from a variety of different media into a dataset that holistically describes place, including landscape, architecture, and other cultural artifacts. (F,SP)

136H. Archaeology After-School Program. (4) Course may be repeated for credit. Prerequisites: 2 or consent of instructor. Formerly 128M. An opportunity to work with sixth-graders in exploring the worlds of archaeology, history, and computer-based technologies. Meets the Method requirement for the anthropology major. (F,SP)

136I. Archaeology and the Media. (4) Prerequisites: 2. Focus on the use of digital media to create narrative practice and products of archaeology. Students build a critical awareness of the way digital media are used by archaeologists, journalists, film and TV producers, and others. Students will experience the introductory stage of the digital media authoring process. (F,SP)

136J. Archaeology and the Media Method. (4) Prerequisites: 136I. This course focuses on the use of digital media to create narratives about the practice and products of archaeology. Students work in teams to produce short videos, websites, digital narrative or digital story from their own research. Students share equally the responsibilities of research and writing, directing, camera, sound recording, and editing. This course satisfies the Method requirement for the anthropology major. (F,SP)

136K. Who Owns the Past? Cultural Heritage in a Digital Age. (4) Students will receive no credit for C136K after taking Letters and Science 127. Three
hours of lecture and one hour of discussion per week. A cross-disciplinary exploration of cultural heritage on a global and local scale through discussion, debate, in-class activities, and team-based research projects that draw attention to the impacts of digital technologies. Themes include the creation and management of heritage sites; the ethics of archaeologists as stewards of the past, and the multiplicity of different interest groups; destruction and looting; and the preservation, conservation, and public presentation of heritage. Also listed as Letters and Science C180W. (F,SP)

137. Energy, Culture, and Social Organization. (4) Three hours of lecture per week. This course will consider the human dimensions of particular energy pro-
duction and consumption patterns. It will examine the influence of culture and social organization on energy use, energy policy, and quality of life issues in both the national and international setting. Special emphasis will be given to mind-sets, ideas of progress, cultural variation in time perspectives and resource use, equity issues, and the role of power holders in energy-related questions. (F,SP)

138A. History and Theory of Ethnographic Film. (4) Three hours of lecture per week. Prerequisites: 3 or 114. The course will trace the development of ethno-
graphic film from its beginnings at the turn of the cen-
tury to the present. In addition to looking at seminal works, recent and innovative productions will be viewed and analyzed. Topics of interest include the role of visual media in ethnography, ethics in filmmaking, and the problematic relationship between the ethnographer and the people being studied. Requirements include film critiques, a film proposal, and a final exam. (F,SP)

138B. Field Production of Ethnographic Film. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: 138A. This course is devoted to training students in methods of ethnographic field film production and fieldwork. Building on the previous coursework in Anthro 138A, students will work toward the production of an ethnographic video from selected project pro-
posals. In addition to weekly discussions of student projects, students will practice and discuss their expertise on aspects of production as well as editing. (F,SP)

139. Controlling Processes. (4) Three hours of lec-
ture per week. Prerequisites: Those with at least one year of anthropology coursework will be more familiar with the subject matter. This course will discuss key theoretical concepts related to power and control and examine indirect mechanisms and processes by which direct control is exercised, voluntarily and under duress, in institutionalized societies. Readings will cover language, law, politics, religion, medicine, sex, and gender. (F,SP)

140. The Anthropology of Food. (4) Three hours of lecture per week. Prerequisites: 3 or equivalent, or consent of instructor. This course examines the distribution of food in society and includes discussions of iden-
tity, taste, taboos, religion, tradition, nationalism, health, alcohol use, civilizing society, globalization, and the global politics of food. (F,SP)

141. Comparative Society. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 3 or consent of instructor. Themes of social structure, functional interrelationships of social institutions. Pri-
mary emphasis on non-Western societies. (F,SP)

142. Kinship and Family. (4) Three hours of lecture per week. Prerequisites: 3. Comparative study of the family and kinship systems in non-state and state societies. (F,SP)

146. Mobile City Chronicles: Gaming with New
Technologies of Detection and Security. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 3 or Sociology 3. An introduction to social theory and ethno-

anthropology in the cross-cultural study of sexuality, particularly sexual orientation and gender identity. The course will stress the relationships between culture, international and local political economy, and consumer culture. An understanding of what this experience means to us will provisionally call homosexual and transgen-
dered desires or identities. Also listed as Lesbian Gay Bisexual Transgender St C147B. (F,SP)

148. Anthropology of the Environment. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The course will focus on understanding the relationships between culture, international and local political economy, and consumer culture. Anthropology 148 is provisionally presented as a research and game lab. Also listed as Pract-
ice of Art C179. (F,SP)

C147B. Sexuality, Culture, and Colonialism. (4) Three hours of lecture per week. Prerequisites: 3 or Sociology 3. An introduction to social theory and ethno-

anthropology in the cross-cultural study of sexuality, particularly sexual orientation and gender identity. The course will stress the relationships between culture, international and local political economy, and consumer culture. An understanding of what this experience means to us will provisionally call homosexual and transgen-
dered desires or identities. Also listed as Lesbian Gay Bisexual Transgender St C147B. (F,SP)

148. Anthropology of the Environment. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The course will focus on understanding the relationships between culture, international and local political economy, and consumer culture. Anthropology 148 is provisionally presented as a research and game lab. Also listed as Pract-
ice of Art C179. (F,SP)

157. Anthropology of Law. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Comparative survey of the ethnography of law; meth-
ods and concepts relevant to the comparative analy-
sis of the forms and functions of law. (F,SP)

158. Religion and Anthropology. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. A consideration of the interplay between religious beliefs and institutions and other aspects of culture. (F,SP)

160. Forms of Folklore. (4) Three hours of lecture and one hour of discussion per week. Prerequi-
tes: Upper division standing. A worldwide survey of the major and minor forms of folklore with special empha-
sis upon proverbs, riddles, superstitions, games, songs, and narratives. (F,SP)

160A. Forms of Folklore. (4) Three hours of lecture and one hour of discussion per week. Prerequi-
tes: Upper division standing. A worldwide survey of the major and minor forms of folklore with special empha-
sis upon proverbs, riddles, superstitions, games, songs, and narratives. (F,SP)

162. Topics in Folklore. (4) Course may be repeated for credit. Three hours of lecture per week. Special topics in folklore or ethno-musicology. (F,SP)

162AC. Topics in Folklore. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division standing. This course satisfies the Amer-
ican Cultures requirement. (F,SP)

166. Language, Culture, and Society. (4) Three hours of lecture per week. Prerequisites: 3 or consent of instructor. The course examines the complex relationship between language, culture, and society. The materials in the course draw on the fields of lin-
guistic anthropology, linguistics, sociolinguistics, phi-
losophy of language, discourse analysis, and literary criticism to explore theories about how language is shaped by, and in turn shapes, our understandings about the world, social relations, identities, power, aesthetics, etc. (F,SP)

169A. Data Analysis and Computational Methods. (4) Three hours of lecture per week. Prerequisites: 2 or consent of instructor. This course capitalizes on a successful approach of using definitional formulas to emphasize concepts of statistics, rather than rote memorization in both qualitative and quantitative anthropology. This conceptual approach constantly reminds the students of the logic behind what they are learning. Procedures are taught verbally, numer-
ically, and visually to help students to reach conclusions. (F,SP)

169B. Research Theory and Methods in Socio-
Cultural Anthropology. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 3. Introduction to research problems and research design techniques to be applied to the study of peoples of the world. Will involve the collection, analysis, and presentation of data. This course requires 15 hours of work per week including class time, outside work, and preparation. One section meeting per week will be required. (F,SP)
170. China. (4) Three hours of lecture per week. Chinese culture and society with an emphasis on the village level. (F.SP)

171. Japan. (4) Three hours of lecture per week. Ethnological treatment of historic and modern Japanese culture, covering history, art, and religion; kinship, and community organization; political, economic, and occupational patterns; cultural psychology and social problems in modern Japan. The approach utilizes both ethnological and psycho-cultural forms of analysis. (F.SP)

172AC. Special Topics in American Cultures. (4) Course may be repeated for credit with different instructor. Three hours of lecture per week. Various topics taught by members of the social/cultural faculty. See the online Schedule of Classes for each semester, and the department’s catalog for course title, description, instructor name, and specific format. This course satisfies the American Cultures requirement. (F.SP)

174AC. California Historical Anthropology. (4) Three Mayan origins, with emphasis on historical archaeology, ethnology, and ethnohistory, this course will take account of ethnic groups and their interaction in early colonial California; Native Americans; mission, presidio, and ranchería communities of Spanish/Mexican California; Russian frontier society at Fort Ross; and American expansion into California, especially the Gold Rush. The course will also examine how the colonial past affects ethnic relations and cultural identity among contemporary California Indians. This course satisfies the American Cultures requirement. (F.SP)

176. Contemporary Latin America. (4) Course may be repeated for credit. Three hours of lecture per week. Emphasis on Iberian-Indian assimilation, African influences, development of folk-peasant societies, and the concept of national cultures. Discussion of contemporary issues will also be covered. (F,SP)

179. Ethnography of the Maya. (4) This course will focus on the Mayan peoples in the Yucatan peninsula, with an emphasis on the cultural and social developments that have taken place since the Spanish conquest and colonization, indigenous resistance and rebellion, and recent pan-Maya activism. (F.SP)

180. European Society. (4) Three hours of lecture per week. Representative groups in historical and modern perspective. Rural, urban relationships and the dynamics of change. (F,SP)

181. Themes in the Anthropology of the Middle East and Islam. (4) Three hours of lecture per week. Prerequisites: 3 recommended. Cultures of the contemporary Middle East and Muslims, with special emphasis upon Arab populations. (F.SP)

183. Topics in the Anthropological Study of Africa. (4) Three hours of lecture per week. Prerequisites: 3 and/or 114. The course will focus on African societies and cultures, as well as on issues relating to the history of Africanist anthropology. Images and Constructs of Africa or Africans will thus be contextualized in relation to prevailing anthropological theories at different times, and in different regions of the continent. (F,SP)

184. South Asia. (4) Three hours of lecture per week. Cultural traditions, social organization, and social change, with an emphasis on India and Pakistan. (F.SP)

188. Topics in Area Studies. (4) Course may be repeated for credit. Three hours of lecture per week. Special topics in cultural areas not otherwise covered. (F.SP)

189. Special Topics in Social/Cultural Anthropology. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 3 or consent of instructor. Various topics covering current research theory, methods; issues of social and cultural concern; culture change, conflict, and adaptation. May combine more than one subdiscipline of anthropological research. (F.SP)

190A. Special Topics in Cultural Anthropology/Area. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 3 recommended. Special topics in cultural anthropology that meet the Area Analysis requirement for the major. (F.SP)

191A-SH91SS. Senior Honors, (4;4) Three hours of tutorial per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to honors students. Systematic readings in history and theory, with an emphasis on the culture and social behavior of human society. This level of instruction is organized to reflect this fact. We will begin by looking at recent debates about the nature and purpose of anthropology. This will provide a starting point for reading a series of classic ethnographies in new ways as well as examining some dimensions of the current research agenda in cultural anthropology.

226. Archaeology of the Pacific. (4) Course may be repeated for credit. Two hours of seminar per week. Subject matter will vary; current issues and debates in the archaeology of the Pacific, e.g., trade, exchange, colonization, maritime adaptations, etc.

227. Historical Archaeology Research. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate standing with some background in archaeology, or undergraduates who have taken 2, 2, or consent of instructor. Historical archaeology seminar. Subject matter will vary from year to year.

228. Method. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Required for all first- and second-year graduate students in archaeology. Three hours of seminar discussion of major issues in the history and theory of archaeological research and practice (229A), and seminar in design and development of geographical and archaeological problems. (229B). To be offered alternate semesters.

236. Writing the Field in Archaeology. (4) Two hours of seminar per week. This seminar is intended to help students gain a working knowledge of the field of archaeology, from initial conceptualization to writing of a field statement, dissertation chapter, or review article. (F,SP)

239. Special Topics in Archaeology. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

250G. Anthropology of Ethics. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Open only to honors students. Theoretical analysis of institutions and practices of ethics and justice. (F,SP)

250F. Religion. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Open only to honors students. Comparative analysis of religious systems, as well as examining some dimensions of the current research agenda in cultural anthropology.

240A-240B. Fundamentals of Anthropological Theory. (S,S) Four to six hours of seminar per week. Prerequisites: Enrollment is strictly limited to and required of all anthropology and medical anthropology graduate students who have not been advanced to candidacy. Anthropological theory—following the rest of the world—has been undergoing important restructuring in the past decade. The course is organized to reflect this fact. We will begin by looking at recent debates about the nature and purpose of anthropology. This will provide a starting point for reading a series of classic ethnographies in new ways as well as examining some dimensions of the current research agenda in cultural anthropology.

250A. Psychological Anthropology. (4) (F,SP)

250C. Globalization. (4) (F,SP)

250E. Anthropology of Politics. (4) (F,SP)

250G. Anthropology of Ethics. (4) (F,SP)
Folklore

260. Problems in Folklore. (4) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor.

C251. Theories of Narrative. (4) Three hours of seminar per week. This course examines a broad range of theories that elucidate the formal, structural, and contextual properties of narratives in relation to gestures, the body, and emotion; imagination and fantasy; memory and the senses; space and time. It focuses on narratives at work, on the move, in action as they emerge from the matrix of the everyday preeminently, storytelling in conversation— as key folk genres—the folktale, the legend, the epic, the myth. Also listed as Folklore C261. (F,SP)

C252A. Theories of Traditioanlity and Modernity. (4) Course may be repeated for credit with different topic and different instructor. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. This seminar explores the emergence of soft modernity and modernity and their reproduction in Eurocentric epistemologies and political formations. It uses work by such authors as Anderson, Butler, Chakrabarty, Clifford, Derrida, Foucault, Latour, Mignolo, Pateman, and Poeveey to critically reread foundational works published between the 17th century and the present along with philosophical texts with which they are in dialogue—in terms of how they are imbricated within and help produce traditions and modernities. Also listed as Folklore C262A. (F)

C252B. Theories of Traditioanlity and Modernity. (4) Course may be repeated for credit with different topic and different instructor. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. This seminar explores the emergence of notions of tradition and modernity and their reproduction in Eurocentric epistemologies and political formations. It uses work by such authors as Anderson, Butler, Chakrabarty, Clifford, Derrida, Foucault, Latour, Mignolo, Pateman, and Poeveey to critically reread foundational works published between the 17th century and the present along with philosophical texts with which they are in dialogue—in terms of how they are imbricated within and help produce traditions and modernities. Also listed as Folklore C262B. (SP)

Linguistics

270A. Semantics. (4) Two hours of seminar per week. Formerly 270A and 271A-271B.

270B. Fundamentals of Language in Context. (4) Three hours of seminar per week. Intensive introduction to the study of language as a cultural system and speech as socially embedded communicative practice. This is the core course for students wishing to take further coursework in linguistic anthropology.

Area Studies

280. Seminars in Area Studies. Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Courses will vary from year to year. See department catalog for detailed descriptions of course offerings for each semester.

280B. Africa. (4)

280C. South Asia. (4)

280D. China. (4)

280X. Special Topics in Area Studies. (4)

290. Survey of Anthropological Research. (1) Course may be repeated for credit. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Required each term of all graduate students prior to their advancement to Ph.D. candidacy.

Independent Study

296A. Supervised Research. (2-12) Course may be repeated for credit. Variable units for field research per week. Prerequisites: Consent of instructor. Practice in original field research under staff supervision. One unit of credit for every four hours of work in the field.

296B. Supervised Research. (4) Course may be repeated for credit. Two hours of consultation per week. Prerequisites: Consent of instructor. Analysis and write-up of field materials.

298. Directed Reading. (1-8) Course may be repeated for credit. One to eight hours of consultation per week. Prerequisites: Consent of instructor. Individual conferences intended to provide directed reading in subject matter not covered by available seminar offerings.

299. Directed Research. (1-12) Course may be repeated for credit. Two to eight hours of conference per week. Prerequisites: Consent of instructor. Individual conferences to provide supervision in the preparation of an original research paper or dissertation.

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. One to eight hours of consultation per week. Must be taken on a satisfactory/unsatisfactory basis. In preparation for Ph.D. examinations. Individual study in consultation with adviser. Intended to provide an opportunity for qualified students to prepare for the viva voce examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the degree.

Professional Courses

300. Graduate Pedagogy Seminar. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Teaching in both the logics and the pedagogical issues of undergraduate teaching.

301. Professional Training: Teaching. (1-6) Course may be repeated for a maximum of 12 units. Two hours of seminar and eight hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Group consultation with instructor. Supervised training with instructor on teaching undergraduates.

Applied Science

and Technology

(College of Engineering)

Office: 230 Bechtel Engineering Center #1702, (510) 642-8790; ast.coe.berkeley.edu

Executive Committee

David T. Atwood (Chair), Ph.D. (Electrical Engineering and Computer Sciences)
Darryl Chizan, Ph.D. (Materials Science and Engineering)
Rojel Dibble, Ph.D. (Mechanical Engineering)
Roger Falcone, Ph.D. (Physics)
Stephen R. Leone, Ph.D. (Chemical Physics)
Philip S. Marcus, Ph.D. (Mechanical Engineering)
Rachel Segelgarm, Ph.D. (Materials Science and Engineering)
Jungoo Wu, Ph.D. (Materials Science and Engineering)
Ei Yablonovich, Ph.D. (Electrical Engineering and Computer Sciences)

Program Overview

The Applied Science and Technology Graduate Group (AST) is administered by the College of Engineering. The program has three major areas of emphasis: applied physics, engineering science, and mathematical sciences. Faculty associated with the program are drawn from several departments within the College of Engineering as well as from the Departments of Physics, Chemistry, Chemical and Biomolecular Engineering, Statistics, and Mathematics. Topics of interest include the novel properties and applications of nano-structures; thin films and interface science; micro-electromechanical systems (MEMS); short wavelength coherent radiation; X-ray micro-imaging for the life and physical sciences; lab-on-a-chip devices and plasma-assisted materials processing; laser-induced chemical processes; laser probing of complex reacting systems; ultrafast phenomena; quantum accelerators; microscopic, chaotic systems; numerical methods; and topics in computational fluid mechanics and reacting flows. This program awards the Ph.D. degree.

In addition, students who are admitted to the program may also apply for the designated emphasis (DE) in Nanoscale Science and Engineering (DE NSE); Energy, Science, and Technology (DE EST); and Computational Science and Engineering (DE CSE). Students usually apply for these DEs during their first or second year of study. For further information about the DE NSE, visit nano.berkeley.edu/educational/DEGradGroup.html; the DE EST, visit ms.berkeley.edu/deest; and the DE CSE, visit cse.berkeley.edu.

Graduate research in the AS&T Program benefits from state-of-the-art experimental facilities at the Berkeley campus and the Lawrence Berkeley National Laboratory. Among these facilities are the National Center for Electron Microscopy, with the world's highest resolution electron microscope; a microfabrication lab for student work involving lithography, MEMS ion-implantation, and thin-film deposition; an integrated sensors laboratory; femtosecond laser and optical, electrical, and magnetic resonance spectrosocopies; short wavelength laser and X-ray research laboratories; an unparalleled variety of material, chemical, and surface science analysis equipment; and a soft X-ray synchrotron dedicated to materials, chemical, and biological research using high-brightness and partially coherent X-rays. The research program, carried out by the AS&T Program faculty, provides ample opportunity to develop new research directions by making the best use possible of these facilities and of the other research instrumentation available to AS&T faculty.

Graduate Courses. Students in the AS&T program take courses from regular departments with the concurrence of faculty advisers. In addition, AS&T sponsors the following courses: AST 210/EE 213, Soft X-rays and EUV Radiation (3 units); 239/EE 239, Partially Ionic Plasmas (3 units); 225/MSE 225, Thin-Film Science and Technology (3 units); 295R/ChemE 295R, Applied Spectroscopy (3 units); Engineering 298B, Topics in Soft X-rays, Nanostructures, and Applications (1 unit); and Engineering 298B, Research Topics in Internal Combustion Engines (1 unit).

Admission. The complete application, including transcripts, GRE scores, TOEFL scores (if applicable), three letters of reference, and a statement of academic and professional goals is due on December 17 for the following fall semester. For more information, students should contact the Applied Science and Technology Graduate Group, 230 Bechtel Engineering Center #1702, University of California, Berkeley, Berkeley, CA 94720-1702; (510) 642-8790; ast.program@coe.berkeley.edu.

Graduate Courses

C210. Soft X-rays and Extreme Ultraviolet Radiation. (3) Three hours of lecture per week. This course will explore modern developments in the physics and applications of soft X-rays. It begins with a review of electromagnetic radiation at short wavelengths including dipole radiation, scattering and refractive index, using a semi-classical approach. The subject matter will include the generation of X-rays with laboratory tubes, synchrotron radiation, laser-plasma sources, X-ray lasers, and black body radiation. Concepts of temporal coherence, spatial/spatial and temporal coherence will be discussed. Also listed as Electrical Engineering C213. (SP) Staff

C225. Thin-Film Science and Technology. (3) Three hours of lecture per week. Prerequisites: Graduate

prefix=course satisfies R&C requirement

prefix=course satisfies American Cultures requirement

prefix=course satisfies W requirement

prefix=online course

prefix=Professor of the Graduate School

prefix=Recipient of Distinguished Teaching Award
C239. Partially Ionized Plasmas. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physics, chemistry, or chemical engineering; courses: quantum mechanics, linear vector space theory. After a brief review of quantum mechanics and semi-classical theories for the interaction of radiation with matter, this course will survey the various spectroscopies associated with the electromagnetic spectrum, from gamma rays to radio waves. Special emphasis is placed on application to research problems in many branches of engineering sciences. Graduate students interested in systematic in situ process characterization, analysis, or discovery are best served by this course. Also listed as Chemical Engineering C295R. (SP) Wu

C295R. Applied Spectroscopy. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physics, chemistry, or chemical engineering; courses: quantum mechanics, linear vector space theory. After a brief review of quantum mechanics and semi-classical theories for the interaction of radiation with matter, this course will survey the various spectroscopies associated with the electromagnetic spectrum, from gamma rays to radio waves. Special emphasis is placed on application to research problems in many branches of engineering sciences. Graduate students interested in systematic in situ process characterization, analysis, or discovery are best served by this course. Also listed as Chemical Engineering C295R. (SP) Reimer

299. Individual Study or Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor; graduate standing. Investigations of advanced problems in applied science and technology. Sponsored by the interdisciplinary Interdisciplinary Studies Center. (F,SP) Staff

Architectural Design

(Change to Environmental Design)

Department Office: 232 Wurster Hall #1800, (510) 642-4842, arch.ced.berkeley.edu
Chair: Tom J. Buresh, M.Arch.

Professors

†Nezar Alsayyad, Ph.D. University of California, Berkeley. Architectural history, urban development in the Third World
*Edward A. Arell, Ph.D. University of Edinburgh. Building technology, energy
Charles C. Benten, M.Arch. Massachusetts Institute of Technology. Building technology
Peter Bosselmann, M.Arch. University of California, Los Angeles. Architecture and urban design
Lisa Iwashiro, M.Arch. Harvard University. Design, architectural fabrication, edge city landscape
Andrew Shanksen, Ph.D. Princeton University. History of American architecture and urbanism, impact of World War II on design professions and American culture
Jill L. Stoner, M.Arch. University of Pennsylvania. Architectural design
Gary R. Brown (Emeritus), M.Arch.
*Sim H. Van der Ryn, M.Arch.
†Marc Treib (Emeritus), M.Arch.
†Dell Upton (Emeritus), Ph.D.
†Mary C. Comerio, M.Arch., M.S.W. Washington University. Special populations
†Edward A. Arell, Ph.D. University of California, Berkeley. Architectural history, urban development in the Third World

Assistant Professors

Nicholas de Monchaux, M.Arch. Princeton University. Design, urban theory, digital representation
M. Paz Gutiérrez, M.Arch. University of Pennsylvania. Architectural design
Ronald Rael, M.Arch. Columbia University. Design and process/practice
Kyle Stellmack, M.A. Massachusetts Institute of Technology. Digital design, computational technologies

Adjunct Associate Professor

Charles A. Huizenga, M.S. University of California, Berkeley. Design and operation of building energy systems

Department Overview

The Department of Architecture at UC Berkeley has a strong tradition of fostering independent design thinking and research. Our award-winning faculty offer vigorous undergraduate and graduate educational programs and carry out leading research in constructed and virtual environments, architectural technologies, and architectural humanities. The multidisciplinary interests of our faculty and graduate students form the basis of exciting new research collaborations with a variety of other disciplines, including anthropology, international studies, engineering, new media, and urban studies.

Architectural Design is more than design. To create livable environments means balancing complex social, political, economic, and technical requirements with human needs. Students take courses in environmental history, behavioral sciences, resource management, and design theory, as well as in the technical, aesthetic, and cultural components of design. The design process prizes freedom, not only good architects but also environmentally knowledgeable citizens.

School Philosophy

Undergraduate Philosophy. Undergraduate study in the College of Environmental Design provides a liberal education among an active community of students, scholars, creative designers, and technologists concerned with the human condition and the physical environment. The professional program is intended to develop students’ abilities to conceive and accurately describe appropriate built spaces at several scales, and to help them learn the processes used to bring buildings into place, and to provide a basis for understanding the consequences that complexes of buildings and open spaces have for inhabitants, society, and the environment.

In both its undergraduate and graduate programs, the department places special emphasis on the studio element of its academic program, recruiting active architecture professionals to work in consultation with regular faculty in leading the courses.

Program Description

Undergraduate Program. Undergraduates enroll in a four-year program leading to the Bachelor of Architecture degree.

The undergraduate program in architecture combines required courses in environmental design and architecture with opportunities for highly varied individual programs. Through its core courses, the program offers a broad introduction to the field of architecture, and through studies in the various areas it provides opportunities to prepare for specialization in the field in the areas of architectural design and representation, architectural technologies and building performance, architectural history, and society and culture. In addition to offering a well-rounded education, undergraduate students can also provide pre-professional competency for entry-level employment in architecture, the option for graduate work in architecture, or further studies in a related environmental design field. At the lower division level, students take an introductory course in environmental design, a two-course studio sequence in drawing and design, prerequisite courses in calculus and physics, and breadth Area courses in natural sciences, social and behavioral sciences, human cultural studies, international studies, philosophy and values, and arts and literature. At the upper division level, students take a two-course architecture studio sequence, a two-course architecture history sequence, three architecture “area studies” courses, and three electives within the college. Additional design and technology courses are recommended for students preparing for Master of Architecture programs. Most students are able to take one-quarter of their program as electives.

Accreditation. In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of accredited degrees: the five-year professional degree and the two- to three-year Master of Architecture. Schools are allowed to offer only one type of accredited program. As such, the four-year Bachelor of Arts in Architecture is not accredited by the NAAB. The Master of Architecture is the accredited professional degree. The undergraduate degree is a four-year program for continuing science professionals, leading to the professional master’s degree program or for employment options in architecturally related areas.
Graduate Programs. The department offers the accredited professional degree Master of Architecture, the academic degree Doctor of Philosophy, and several other degree programs as described below.

Master of Architecture (M.Arch.). The Master of Architecture program is designed to provide students seeking their first accredited professional degree with a comprehensive and challenging education that integrates the liberal arts with professional education. Graduates have the flexibility to choose a variety of paths within a two- to three-year rigorous program, depending upon previous education and experience. Admission makes no accommodation as to the field of undergraduate preparation. However, the length of the required residence period, the number of required course units, and the required courses are dependent upon undergraduate major, professional and other work experience, and previous graduate study, if any.

Additional prerequisites for admission to the professional Master of Architecture program are college-level or equivalent mathematics through analytical geometry and beginning calculus and beginning physics through mechanics.

A required studio each semester introduces design issues through the study of a variety of building types. The curriculum in technology and building performance, history, society and culture, and professional practice provides the breadth and background for the individual's professional education and career goals. Students who have not taken equivalent courses at other institutions may have the requirements waived to allow for more elective units.

The basic course leading to the Master of Architecture program takes three academic years and requires the completion of at least 72 units during that period of residence. Persons who hold a Bachelor of Arts or Bachelor of Science degree with a major in architecture may receive up to one year of advanced standing individually for each student at the time she or he first registers for graduate study. The graduate assistant committee of the department will determine the specific amount of advanced standing individually for each student at the time she or he first registers for graduate study. Additional information is available from the department's graduate assistant.

Program in Visual Studies (M.A. Degree in Design). There is a small program in Visual Studies at the graduate level leading to the Master of Arts degree in design. Students with an interest in pursuing graduate work involved with visual design issues may apply.

The present degree is offered under Plan 1 of the Graduate Division, which requires 20 semester units plus a thesis. The length of time required for completion varies with the individual, depending in part upon previous preparation. An undergraduate degree from the College of Environment and Natural Design or in an art-related field is helpful but not necessary. The emphasis in the admission process is on the portfolio that all applicants for admission to the graduate program must submit.

Concurrent Program with the Department of City and Regional Planning. The Department of Architecture and City and Regional Planning offer a concurrent degree program leading to the dual M.Arch. and M.C.P. degrees for students holding the five-year Bachelor of Arts/Bachelor of Science degree in architecture, or equivalent degrees in related disciplines. The Master of City Planning degree requires the completion of 36 semester units; the M.Arch. segment calls for 24-72 semester units, depending upon the undergraduate degree. Applicants should inform the department if they wish to be considered for the Concurrent Program in Architecture and City and Regional Planning when completing the UC Berkeley Graduate Application.

Concurrent Program with the Department of Landscape Architecture and Environmental Planning. The Departments of Architecture and Landscape Architecture and Environmental Planning offer a concurrent degree program. This program will lead to two professional degrees: Master of Architecture and Master of Landscape Architecture. The program brings together two closely connected branches of environmental design—the design of sites and the design of buildings. This program is for exceptionally qualified students who have an undergraduate degree in architecture or landscape architecture and who satisfy the admission requirements of the one- or two-year M.Arch. program and/or the two-year M.L.A. program. Applicants should arrange to be considered for the Concurrent Program in Architecture and Landscape Architecture when completing the UC Berkeley Graduate Application. Acceptance into the concurrent degree program is limited to outstanding applicants. More information may be obtained from the graduate office in 202 Wurster Hall or from the Department of Landscape Architecture and Environmental Planning website at laep.ced.berkeley.edu.

Concurrent Degree Program with the Department of Civil and Environmental Engineering, Division of Structural Engineering, Mechanics, and Materials. The two departments offer a joint program with a concurrent degree for exceptionally qualified students. Students must fulfill the course requirements for both departments but are allowed a reduction in elective units that will achieve a satisfactorily high GPA. In addition to satisfying all Graduate Division and departmental requirements for the Master of Architecture, M.S., or Ph.D. degrees, students in this concurrent program must complete a minimum of 60 units outside the special area agreed upon with the IAS adviser.

For additional information on these degree programs, visit arch.berkeley.edu/programs or the graduate office.

Special Activities and Programs

The department offers several unique programs and activities including study-abroad programs for undergraduate students and internationally focused studios for graduate students. Recent studio programs have worked in India, Thailand, Mexico, Brazil, and Italy. The college also offers career workshops, job fairs, and internship placements. A weekly lecture series offers students the opportunity to hear internationally acclaimed speakers from professional organizations such as the American Institute of Architects. Cross-disciplinary connections are established in joint graduate degree programs with the Departments of City and Regional Planning and Landscape Architecture and Environmental Planning as well as the Division of Structural Engineering, Mechanics, and Materials and the Department of Civil and Environmental Engineering. A post-professional Master of Urban Design degree is also available in the college.

Department publications include Process, Construct, Architecture and Media, and the refereed journals Places and Traditional Dwelling and Setlements Review.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program was designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments and topics vary from department to department and semester to semester. (F:SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Prior credit for freshmen and sophomores. Freshman and sophomore seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F:SP) Staff

Recipient of Distinguished Teaching Award
Architectural Design and Representation: Professional Practice

Upper Division Courses

100A-100B. Fundamentals of Architectural Design. (6,8) Two hours of lecture, six hours of studio, and two hours of computer graphics laboratory per week. Prerequisites: ED 11A-11B. Must be taken in sequence. Introductory courses in the design of buildings. Problems in the conceptual strategies of form and space, relationships and social, technological, and environmental considerations.

100A focuses on the conceptual design process. 100B stresses tectonics, materials, and energy considerations. Studio work is supplemented by lectures, discussions, readings, and field trips. (F,SP) Staff

101. Case Studies in Architecture. (5) Course may be repeated for credit as topic varies. Three hours of lecture and two hours of studio per week. Prerequisites: 100A-100B. Problems in the design of buildings of intermediate complexity. Each section deals with a selected topic and concentrates on developing conceptual strategies in the design of buildings: internal spatial relationships, material, form, tectonics, social and environmental considerations, and built landscapes. Studio work is supplemented by lectures, discussions, readings, and field trips. (F,SP) Staff

107. Introduction to the Practice of Architecture. (3) Three hours of lecture per week. Formerly 120. Introduction to the business of architecture including client, developer, and contractor relations, design proposals, competition and other marketing approaches as well as ethical issues of professional practice. (F,SP) Staff

108. Architectural Internship. (5) Two hours of lecture/seminar per week for 15 weeks and an additional 16 hours of internship per week for 10 of those weeks. Prerequisites: 100B or consent of instructor. Formerly 128. An intensive and structured exposure to the professional practice, using the resources of practicing professionals as the "lab." The seminar discussion focus on understanding how design happens, how projects are managed, and how buildings are constructed. (SP) Comero

109. Special Topics in Architectural Design. (1-4) Course may be repeated for credit as topic varies. One to four hours of seminar per week. Prerequisites: Consent of instructor. Selected topics in the theories and concepts of architectural design. For current offerings, visit the department website. (F,SP) Staff

122. Principles of Computer-Aided Architectural Design. (4) Three hours of lecture and one and one-half hours of supervised laboratory sessions per week. Formerly 212. This course introduces students to the conceptualization and re-presentation of the architect’s New Media; why and how computers are being used in architecture, and what are their current and expected impacts on the discipline and practice of architecture. Students examine the relationship between computer-aided design and the analysis of relationships of concepts and their future uses of computers in architectural design (including such topics as construction automation, smart buildings, and virtual environments). The laboratories introduce students to REVIT, a state-of-the-art architectural software, including drafting, modeling, rendering, and for building information modeling. The course is co-listed with 222. (F) Staff

127. Workshop in Designing Virtual Places. (4) Three hours of seminar and one and one-half hours of supervised laboratory sessions per week. This course introduces students to designing web-accessible Multi User Virtual Environments (MUVEs), inhabited through avatars. Such worlds are used in video games and web-based applications, and are assuming their role as alternative "places" to physical spaces, where people can locate, affiliate, and socialize. Virtual worlds are designed according to the same principles that guide the design of physical spaces, with allowances made for the absence of gravity and other laws of nature. The course combines concepts from architecture, film studies, and video game design. It uses a game engine software and a modeling software to build, test, and deploy virtual worlds. (SP) Staff

129. Special Topics in Digital Design Theories and Methods. (1-4) Course may be repeated for credit as topic varies. One hour of lecture/seminar per unit per week. Prerequisites: Consent of instructor. Topics cover advanced and research-related issues in digital design and New Media, related to architecture. For current offerings, visit the department website. (F,SP) Staff

133. Architectures of Globalization: Contested Spaces of Global Culture. (3) Three hours of lecture/seminar per week. Prerequisites: This course is open to all graduate students and upper division undergraduate students. This seminar examines the relationships between architecture and the processes associated with globalization. The social and spatial changes connected to the global economic restructuring of the last four decades are explored in relation to the dynamic interaction of political, economic, technological, and cultural forces such as colonization and imperialism. Theoretical arguments about international urban political economy, uneven development, deindustrialization, and the growth of tourism and service industries are grounded in specific urban and architectural contexts. Case studies explore issues such as urban entrepreneurialism and the branding of cities and nation-states; heritage practices and the postcolonial politics of place; border cities, and the urbanism of transnational production; cities, terrorism, and the global architecture of security; critical regionalism, localism, and other responses to debates on place and placeness. Readings and class discussions examine course themes in a comparative framework and consider their implications for architectural design, education, and professional practice. (F,SP) Cysler

136. The Literature of Space. (3) Three hours of seminar per week. The concept of space as it is applied to the fields of architecture, geography and urbanism can be understood as a barometer of the condition that we call "modernity." This course explores connections and interactions of concepts of space of the past century, and the idea of space as it has been perceived, conceived, and lived during this period. Readings include essays from the disciplines of philosophy, art history, psychology, and urbanism, and short works of fiction that illustrate and elucidate the spatial concepts. The readings are chosen according to themes that form the foundation for weekly seminar discussions. Chronological and thematic readings reveal the force of history upon the conceptualization of space and its contradictions. (F) Stoner

Graduate Courses

200A-200B. Fundamentals of Architectural Design. (8,8) 200A must be taken on a satisfactory/unsatisfactory basis. 200B must be taken for a letter grade. Four hours of lectures/seminar, eight hours of studio, and four hours of laboratory per week. Introductory course in architectural design theories and methods for graduate students. Problems emphasize the major formal, spatial, tectonic, social, technological, and environmental determinants of built form. Studio work is supplemented by lectures, discussions, readings, and field trips. (F,SP) Staff

201. Case Studies in Architectural Design. (5) Course may be repeated for credit. Two hours of lectures/seminar per week. For current offerings, visit the department website. (F,SP) Staff

202. Final Project Studio. (5) Eight hours of studio per week. Focused design and research as the capstone project for graduate students. (F,SP) Staff

203. Final Project Preparation Seminar: Thesis. (3) Students may take 203/204 or 203/205 to complete the studio requirements. Three hours of seminar per week. Prerequisites: Graduate standing. Formerly 208D. Specific research topics organized to prepare students for their final project studio or thesis. (F,SP) Staff

204. Final Project Studio: Studio Thesis Option. (5) Eight hours of studio per week. Formerly 202A. Focused design research as the capstone project for graduate students.

205. Final Project Studio: Independent Thesis Option. (5) Eight hours of studio per week. Prerequisites: Consent of chair of graduate advisers during fall semester. (F)

208. Introduction to Construction Law. (3) Two hours of seminar/discussion per week. The course introduces graduate students to legal and related professional issues that impact the design professional’s career. Careful practitioners can avoid or mitigate many legal problems through vigilance and loss prevention techniques. Course topics include standard of care, business formation, contract law, and negotiation, intellectual property rights, projects delivery models, insurance, and dispute resolution. (SP) Sharafian

209. Special Topics in Architectural Design. (1-4) Course may be repeated for credit as topic varies. One to four hours of seminar per week. Prerequisites: Second- or third-year graduate standing. Formerly 209X. Topics deal with major problems and current issues in architectural design. For current offerings, visit the department website. (F,SP) Staff

209A. Seminar in Architectural Theory. (1-4) (F,SP)

209C. Current Issues in Architecture. (1-4) One to four hours of seminar per week. (F,SP)

209X. Special Topics: Architectural Design. (1-4) (F,SP)

221. Graduate Seminar in Digital Design Theories and Methods. (3) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly 235. This seminar is intended to help graduate students develop a consistent research agenda and focus on areas of specialization in architectural design theories and methods. In addition, it is intended to serve as a forum for the exchange of ideas (e.g., work in progress, potential directions for research, etc.) in the area of shared interest. The course pro-

from department to department and from semester to semester. (F,SP) Staff
vides students with a set of questions as guides, readings, and guest lectures. (F,SP) Staff

222. Principles of Computer-Aided Architectural Design. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. This course introduces students to architectural programming and evaluation (using examples from structures, energy, acoustics, and human factors); the future uses of computers in architectural design (including such topics as constraint databases, expert systems, genetic algorithms, and neural networks); and the relationship and prediction (using architectural design theory and practice in relation to changing social and historical conditions. The course follows the rise of modernist design thinking, with particular emphasis on the role of technical rationality across multiple fields in the post World War II period. Systematic approaches based in cybernetics and operations research (among others) are examined in the attempts to develop a science of design. Challenges to modernist design thinking, through advocacy planning and community-based design, the influence of social movements and countercultures, and parallel developments in postmodern and higharchitecture, provide the critical backdrop for consideration of recent approaches to design theory, including those informed by developments in digital media, new materials, and production techniques on architectural education and practice are explored and the implications for architectural theory assessed. Key concepts are introduced in the study of buildings, urban spaces, and the institutions and agents of architectural culture. (F,SP) Crysler

176. American Architecture. (3) Three hours of seminar per week. The first half of this course surveys American architecture from Colonial times to contemporary trends. Stylistic and spatial analysis is linked to the socioeconomic, political, and environmental influences on architecture, issues on originality, American exceptionalism, the influence from abroad, regionalism, and the role of technology. The second half delves more deeply into the history of specific building types—house, church, museum, library—grafting the earlier themes onto a history of modern institutions as well as those of early American history. Several themes thread their way through the course, including the role of the “urbane” in architectural practice; the uses of the future in the construction of national and personal identities, cultural narratives, and modern mythologies; and the importance of the future as cliché, and the role of play in cultural production. (F,SP) Shanken

179. Special Topics in the History of Architecture. (1-4) Course may be repeated for credit. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Consent of instructor. Special topics in architectural history. For current section offerings, visit the department website. (F,SP) Shanken

Graduate Courses

211. Theory and Methods in the Social and Cultural Basis of Design. (3) Course may be repeated for credit. Three hours of seminar per unit plus individual advising. Prerequisites: 110 or consent of...
212. Body-Conscious Design: Shoes, Chairs, Rooms, and the Human Body. Three hours of seminar per week. Prerequisites: Consent of instructor. The course explores the relationship between the human body and design environments. The focus is on the design of spaces and objects that are responsive to the body's needs and desires. Through case studies and critical analysis, students will examine the ways in which design can address physical and psychological comfort.

216. The Sociology of Taste in Environmental Design. Three hours of seminar per week. Prerequisites: 110 or consent of instructor. Taste is at work in the way we interact with our environment. This course examines the sociological aspects of taste, focusing on how it is perceived, conceived, and lived during this period. Class readings and discussions reveal the force of history upon perceptions of the built environment.

230. Advanced Architectural Design Theory and Criticism. Thirty-five hours of lecture/seminar per semester. Prerequisites: 130A or consent of instructor. Seminar in the analysis and discussion of contemporary and historical issues in architectural design theory and criticism.

239X. Special Topics: Design Theories and Methods. One and one-half hours of lecture and one and one-half hours of seminar per week. Prerequisites: This course is open to all graduate students and upper division undergraduates. This seminar examines the relationship between architecture and the processes associated with globalization. The social and spatial changes connected to the global economic restructuring of the last four decades are explored in relation to distinctive national conditions and their connection to historical forces such as colonization and imperialism. Theoretical and critical arguments are based on a comparison of postwar European economy, uneven development, deindustrialization, and the growth of tourism and service industries are grounded in specific urban and architectural contexts.

239A. Design and Housing in the Developing World. Sixty hours of lecture/seminar per semester. Prerequisites: Doctoral candidate or consent of instructor. Selected topics in contemporary and historical urban design that inform current design practice. Topics include housing, urban parks, and mixed-use development. For current offerings, visit the department website.

271. Methods in Historical Research and Criticism in Architecture. Forty hours of lecture/seminar per semester. Prerequisites: Doctoral candidate or consent of instructor. This course examines the methods of architectural research and critical practice. Topics include historical methods, research methodologies, and the preparation of written work. A major research project is required.

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instructor. Explores a variety of theories that explain and document the relationship between humans and the environment they build; outlines the research methods appropriate to each theory. (SP) Cranz

217. Social Aspects of Housing Design: Mid-Rise, Urbanism. Three hours of seminar per week. Prerequisites: Consent of instructor. The course explores strategies to bring coherence and continuity back to the city focusing on mid-rise, higher density urbanism and the potential and difficulties of this scale of urban fabric to contribute to the form of cities, without losing the potential of choice and diversity. The seminars are organized in case studies revolving around form, infrastructure, Barcelona, Tokyo, Hong Kong, and New York. Design exercises parallel the case studies as a way to test and challenge the potentials of mid-rise urbanism. (SP) Chow

218. Housing, Urbanization, and Urbanism: Design, Planning, and Policy Issues in Developing Countries. Four hours of lecture and one-half hours of seminar per week. This seminar is concerned with the study of housing, urbanization, and urban development in countries, studying not only the physical landscapes of settlements but also the social and economic conditions and events. This course’s focus will be on housing; its lens will be their processes of urbanization; and its intent will be to investigate the space for action by the professional world toward the “urban.” While the emphasis of the course will be on the diverse trajectories of developing countries, “First World” experiences will also be used to illuminate the specific transnational connections and their use in the making of housing theory and policy. The seminar complements the series of lectures offered in 111 and City Planning 111. (SP) Ali Sayad

219. Special Topics in the Social and Cultural Basis of Design. (1-4) Course may be repeated for credit as topic varies. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Consent of instructor. Topics include the sociology of taste, personal and societal values in design, participatory design, and the global architecture of public and private spaces.

237. Ulterior Speculation: Monographs and曼?hologies. Three hours of seminar per week. An exploration of the conceptualization of space and its contradictions. (F) Stoner

273. Ulterior Speculation: Monographs and Manifestos. Three hours of seminar per week. An examination and analysis of architectural manifestos and monographs from the first half of the 20th century to today. The seminar analyzes the possibilities and limits of grounding a discourse in practice as well as theory. The seminar complements the series of lectures and discussions explore the post-WWII world crisis in modernism, postmodernism within and beyond architectural culture, and more recent developments around issues
such as rapid urbanization, sustainability, the politics of cultural identity and globalization. Transformations in architectural theory are examined in relation to historic theory through surveys, the growth and transformation of cities, and the changing relationship between design professions and disciplines. The influences of digital media, new materials, and production techniques on architectural education and practice are explored and the implications for architectural theory assessed. Key issues are anchored in case studies of buildings, urban spaces, and the institutions and agents of architectural culture. (F.SP) Cylster

276. Spaces of Recreation and Leisure, 1850-2000. (3) Three hours of lecture per week. A reading and research seminar surveying the building types, social relations, and cultural ideas of recreation in the American city, including the tensions between home, public, and commercial leisure settings. Offered alternating years. (SP) Groth

278. Visionary Architecture. (3) Three hours of seminar per week. Prerequisites: 170A-170B and consent of instructor. This course explores architectural visions as historical windows, examining them from a number of angles. Using a variety of case studies drawn from different media (architectural theory, film, advertisements, architectural projects, and so on) and periods (turn of the century, the Modern Movement, Depres- sion, 1960s, etc.), it provides a survey of possibilities and models for the final student project—an in-depth, original research paper. Sev- eral themes thread their way through the course, including the role of play and leisure in architectural and architectural practice; the uses of the future in the construction of national and personal identities, cultural narratives, and modern mythologies; the impor- tance of the future as cliché, and the role of play in cultural production. (F.SP) Shanken

279. Special Topics in the History of Architecture. (1-4) Course may be repeated for credit as topic varies. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Consent of instructor. Selected topics in the history of architecture. For current offerings, visit the department website. 279D. History of Housing. (1-4)

281. Methods of Inquiry in Architectural Research. (4) Four hours of lecture/discussion per week. Prerequisites: M.S. or Ph.D.-standing or consent of instructor. This is the introductory course in methods of inquiry in architecture research to be required of all entering Ph.D. students in all areas of the program. The purpose is to train students in pre-dissertation and pre-thesis research strategies, expose them to a variety of inquiry methods including the value of schol- arly research, the nature of evidence, critical reading as content analysis and writing, presenting and illust- rating scholarship in the various disciplines of archi- tecture. (F) Staff

Architectural Technologies and Building Performance

Upper Division Courses

140. Energy and Environment. (4) Three hours of lecture and three hours of discussion/laboratory per week. Prerequisites: Physics or equivalent, or consent of instructor. This course provides undergraduates and graduates with an introduction to issues of phys- ical building performance including building thermo- dynamics, daylighting, and control. The course course presents the fundamentals of building science while recognizing the evolving nature of building technologies, energy efficiency, ecology, and responsible design. The course begins with a detailed explication of the physical processes of materials, heat transfer through building assemblies, balance point tempera- ture, solar geometry, and shading analysis. Students apply these principles later in the course to a design project. The course also provides a survey of broader building science topics including mechanical system design, microclimate, and cur- rent developments in energy-efficient design. (SP) Benton, Brager

142. Sustainability Colloquium. (1,2) One and one- half hours of seminar per week. Must be taken on a passed/not passed basis. Presentations on a variety of topics by practicing professionals from leading firms and institutions. (F) Brager

144. Introduction to Acoustics. (1) Three hours of lecture/discussion per week for five weeks. Must be taken on a passed/not passed basis. This course focuses on what architects need to know about acous- tics. The course covers the fundamentals of architectural acoustics including how sound levels are described and measured, and human response to sound. The course then covers building acoustics, mechanical equipment noise, architectural control, office acoustics, design of sound amplification systems, and environ- mental acoustics. (F) Saltzer

149. Special Topics in Energy and Environment. (1-4) Course may be repeated for credit. One hour of lecture/seminar per unit per week. Prerequisites: 140 and consent of instructor. Special topics include cli- matic design, heating, ventilating, air-conditioning sys- tems, lighting, and acoustics. For current offerings, visit the department website. (F.SP)

150. Introduction to Structures. (4) Forty-five hours of lecture and 45 hours of laboratory per semester. Prerequisites: Physics 8A. Study of forces, materials, and structural significance in the design of buildings. Emphasis on understanding the structural behavior of real building systems. (F) Black

154. Design and Computer Analysis of Structure. (3) Thirty hours of lecture and 45 hours of laboratory per semester. Prerequisites: 150. Design and analysis of whole structural building systems with the aid of finite element analytical methods. Advanced struc- tural concepts explored in a laboratory environment. (SP) Black

155. Structure, Construction, and Space. (3) Three hours of lecture/seminar per week. Prerequisites: 150. In profound buildings, the structural system, construction materials, and architectural form work together to create an integrated work of art. Current practice segregates these three areas by assigning separate and rigid roles to: (1) an engineer, (2) a contractor, and (3) an architect. The goal of this class is to blur these traditional boundaries and erase the intel- lectual clefth through hands-on experience. Students are given weekly assignments that focus on one or more of the three areas. They may be asked to analyze a structural component, materials, or construction details, or research a case study and present it to the class. Each assignment geared to help students integrate construction and structural issues into their architec- tural design, that can maintain control of the entire design process. (F) Black

159. Special Topics in Building Structures. (1-4) Course may be repeated for credit. One hour of lec- ture/seminar per unit per week. Prerequisites: 150 and consent of instructor. Special topics such as experimental structures and architectural preserva- tion. For current offerings, visit the department website. (F,SP)

160. Introduction to Construction. (4) Three hours of lecture and three hours of laboratory per week. This introduction to the materials and processes of construction takes architecture from design to real- ization. The course will cover four material groups commonly used in two of the building assembly (structure and envelope): wood, concrete, steel, and masonry. How and for what purposes these materials are conventionally used. By observing construc- tion, you’ll see how our decisions affect the size of materials, connections, and where they are assem- bled. Architects need to understand the conven- tions but also the potential in materials, so we will also study unusual and new developments. (SP) Black

169. Special Topics in Construction Materials. (1-4) Course may be repeated for credit. Fifteen hours of lecture/seminar per unit per semester. Pre-
Models can predict a design’s performance in quantitative detail and provide immediate visual information for assessment of qualitative issues. Student work will include construction and analysis of lighting models, as well as a series of exercises designed to hone students’ capacities to observe and understand light. (F,SP) Benton, Brager

249. Special Topics in the Physical Environment in Buildings. (1-4) Course may be repeated for credit as topic varies. Prerequisites: 120 or equivalent. Three lecture/seminar units or seminar/ studio per semester. (F,SP) Buntrock

253. Seismic Design and Construction. (3) Three hours of lecture/seminar per week. Prerequisites: 150. Contemporary design and construction techniques for improving the performance of new and existing structures in earthquakes. Topics will include: (1) basic principles of seismic design and building performance, (2) retrofit of existing buildings and evaluation techniques, and (3) design and planning for disaster recovery and rebuilding. The course will use Bay Area and campus buildings as case studies. (F) Comenio

255. Structure, Construction, and Space. (3) Three hours of lecture/seminar per week. Prerequisites: 150. In profound buildings, the structural system, construction materials, and architectural form work together to create an integrated work of art. Current practice segregates these three areas by assigning separate and rigid roles to: (1) an engineer, (2) a contractor, and (3) an architect. One of the goals of this class is to cross these traditional boundaries and erase the intellectual cleft through hands-on experience. Students are given weekly assignments that focus on one or more of the three areas; they may be asked to analyze a structure, construct something from actual materials, or research a case study and present it to the class. Each assignment is geared to help students integrate construction and structural issues into their architectural designs so that they never lose control of the entire design process. (F,SP) Black

256. Structural Design in the Studio. (1-3) Three hours of seminar per week. Prerequisites: 150 or equivalent. Teaching structures to architecture students on their own turf: in a design studio. The course is organized around weekly desk reviews and assignments for students enrolled in a 201 design studio or thesis. The reviews and assignments focus on the structural issues of the students’ projects. A central goal of the course is to help students understand structural issues as they relate to design and to help them become comfortable with structural concepts, so that they can begin to think structurally from the beginning of the design process to the building. The course can be taken for 1, 2, or 3 units, depending on the amount of time a student wishes to commit to it. A final report showing the evolution of each student’s project with clear references to how structural issues are being influenced design decisions is required of all students regardless of units taken. Enrollment strictly limited to 10 students. (SP) Black

259. Special Topics in Building Structures. (1-4) Course may be repeated for credit as topic varies. Fifteen hours of lecture per unit per semester. Prerequisites: Consent of instructor. Selected topics in building structures such as experimental structures and architectural structures. For current offerings, visit the department website. (F,SP) Buntrock

259X. Special Topics: Building Structures. (1-4) One to four hours of lecture per week. Special topics such as experimental structures and architectural preservation. (F,SP) Staff

260. Introduction to Construction, Graduate Level. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course addresses the methods and materials of construction. While students will not be experts at the end of the semester, the course should give students the confidence to feel comfortable on a construction site or when designing a small building for a studio. The course will focus on four major territories: (1) structural materials; (2) building envelope; (3) built elements such as stairs and cabinets; and (4) costs, labor conditions, conventional practices, and the regulatory environments that control design. (F) Buntrock

262. Architecture in Detail. (3) Course may be repeated for credit. Three hours of seminar per week. This seminar will reevaluate the material nature of buildings by studying and understanding construction details and the new technologies that are revolutionizing design construction and labor relations in architecture. (F) Davids

264. Off-Site Fabrication: Opportunities and Evils. (3) Three hours of seminar per week. Prerequisites: 160, 260, or consent of instructor. This seminar looks at the implications of off-site fabrication in architecture: consistent, protected environments; worker efficiency and safety; traditional construction techniques and new. Semi-skilled labor, construction periods shortened; and completion dates more predictable. Off-site fabrication can allow for increased refinement and trial assemblies. However, it may also create monotonous sameness when the processes and results are not considered with care. (F) Buntrock

265. Japanese Craft and Construction. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 150, 160, or consent of instructor. The class addresses the role craft and construction play in Japanese architecture and applies these lessons to the evaluation of an exemplary recent building having unusual technical features. Buildings are expressions of the forces of history, culture, and economic forces; Japanese architecture is regarded as particularly innovative. In studying a system where there is an emphasis on collaboration, students will also gain an understanding of the values of modern systems of architectural production. (SP) Buntrock

269. Special Topics in Construction and Materials. (1-4) Course may be repeated for credit as topic varies. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: Consent of instructor. Selected topics such as construction management implementation and geological hazards to construction. For current section offerings, visit the department website. (F,SP) Staff

Special Studies Courses

Upper Division Courses

180A-180B. Introduction to Visual Studies: Word and Image. (4,4) Thirty hours lecture and 90 hours studio per semester. Prerequisites: Environmental Design 11A-11B or consent of instructor; A is prereq. to B. Projects in graphic form, color, and word/image relationships.

181. Introduction to Photography. (4) Three hours of lecture and three hours of laboratory per week. This course will use the visual vocabulary of the digital camera as a way to record, record, and create. Students will gain technical mastery over the camera, image workflow, image editing, printing, and other forms of presentation. Exposure to the history and most current trends of the medium will broaden students’ understanding of how photographs speak. Topics of discussion will include how to create a sense of place, and building a narrative structure. (F,SP)

185. Selected Topics: Word and Image. Course may be repeated for credit as topic varies. Prerequisites: Environmental Design 11A-11B. Studio sections in areas such as calligraphy, the history of letter forms, and typography. For current offerings, visit the department website.

C185A. Visual Autobiography. (4) Six hours of lecture per week. Prerequisites: Consent of instructor. Since visual and literary studies have historically been viewed as separate disciplines, we will use theories from both to study those forms of self-representation that defy disciplinary boundaries, or what we call “visual autobiography.” This course will help students become conversant with the elements of alphabetic literacy (reading and writing) and visual literacy (observing and making) in order to develop a third distinctive textual/visual literacy. Also listed as Undergrad Interdisciplinary Studies C135, American Studies C174, and English C143V. This course satisfies the American Cultures requirement.

185X. Special Topics: Word and Image. (1-4)

186. Selected Topics: Photography. Course may be repeated for credit as topic varies. Prerequisites: 181A-181B. Studio sections in Art Form, Documentary Photography, Light and Motion Studies, Artificial Lighting Photography. For current section offerings, visit the department website.

186A. Documentary Photography. (3) Three hours of lecture per week. (F,SP) Benton

Visual Studies

Special Studies Courses

Upper Division Courses

186. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. This course may be repeated for credit to reside under the requirements for the doctoral degree. (F,SP) Staff

Professional Courses

300. Seminar in the Teaching of Architecture. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This class is intended for first-time graduate student instructors, especially those who are teaching in studio and lab settings. The class covers a range of issues that normally come up when teaching, offers suggestions regarding how to work well with other graduate student instructors and faculty, and how to manage a graduate student instructor’s role as both student and teacher. The greatest benefit of this class comes from the opportunity to explore important topics together. Using a relatively light but provocative set of readings, the seminar will explore the issues raised each week. There will be one assignment intended to help students explore their own expectations as educators. (F) Staff

Professional Courses
Art and History of Art (College of Letters and Science)

Practice of Art
Department Office: 345 Kroebel Hall, (510) 643-2582
art.berkeley.edu
Chair: Prof. Hertha D. Sweet-Wong

Staff
Robert L. Hatman (Emeritus), M.A.
Anne L. Healy (Emerita), M.A.
Robert L. Hartman (Emeritus), M.A.
Richard B. Shaw, M.F.A.

Associate Professors
Greg Niemeyer, M.F.A.
Anne L. Healy (Emerita), M.A.

Assistant Professor
Brody Reeman, M.F.A.

Professor-in-Residence
Squeak Carnwath (Emeritus), M.F.A.

Department Overview
Four goals underlie the teaching in the Department of Art:
(1) To advance the body of knowledge of human experience through aesthetic investigation.
(2) To help students learn to think visually.
(3) To help students understand the strategies that artists have devised to deal with aesthetic problems in both traditional and nontraditional methods of artmaking.
(4) To help students develop a creative intelligence through practice. Art as a prerequisite for upper-division courses.

Graduate Courses
200. Advanced Visual Studies. (1-3) Course may be repeated for credit as topics vary. Fifteen hours of lecture/seminar per unit per semester. Prerequisites: 191, 196. Advanced work in visual studies and photography. (F,SP)

280. Special Group Study. (1-4) No more than 4 units allowed each semester. Course may be repeated for credit. Must be taken on a passed/not passed basis. Special group studies on topics to be introduced by instructor or student. (F,SP)

299. Individual Study and Research for Master’s Students. (1-4) Course may be repeated for credit. One unit will be assigned for each 4 hours of student effort per week. Individual studies including reading and individual research under the supervision of a faculty adviser and designed to reinforce the student’s background in areas related to the proposed topic. (F,SP)

Art History of Art

Prerequisites
C prefix = course satisfies R&C requirement
H prefix = honors course

Lower Division Courses
8. Introduction to Visual Thinking. (4) Three hours of lecture and six hours of studio per week. Formerly 8A-8B. A first course in the language, processes, and media of visual art. Coursework will be organized around weekly lectures, visual arts that will introduce students to the nature of art making and visual thinking. (F,SP) Staff

12. The Language of Drawing. (3) Three hours of lecture and six hours of studio per week. Prerequisites: 8. A study of drawing as a tool for articulating visual experience, hand, and mind. Students will be expected to develop a visual vocabulary and investigate when coordinated. Some sessions will be devoted to drawing the human figure. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

13. Language of Painting. (3) Three hours of lecture and six hours of studio per week. Prerequisites: 8. A concentrated investigation of what painting on a two-dimensional surface can elicit from what is both observed and felt. Illustrated talks will help familiarize you with issues that have concerned painters in the 20th century. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

17. The Language of Sculpture. (4) Four hours of lecture and six hours of studio per week. Prerequisites: 8. This course is the study of the interaction between physical form and space. We will focus on building a strong conceptual foundation and develop the student's practical skills needed to translate your ideas into three dimensions. Shop practices will include hand, machine, and computer-aided fabrication. Field trips and illustrated talks will help acquaint students with the ideas sculptors have explored through history and in contemporary sculptural practices. (F,SP) Staff

16. Introduction to Printmaking. (4) Six hours of lecture and three hours of studio per week. This course explores various print disciplines. Students study and create traditional forms and fairs fine art printmaking including woodcut, lithography, intaglio, and screenprinting, as well as newer approaches which include transfer and digital printmaking. This course is a prerequisite for advanced courses. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

21. Digital Photography: The Image and the Hive Mind. (4) Two hours of lecture and seven hours of studio per week. This class provides a basic foundation for digital photography: an introduction to the use of digital cameras and online image dissemination. Topics include image capture, composition, image syntax, image analysis, image manipulation, metadata, production, and image sequencing for visual narratives. We also study image dissemination through online networks including social networks, blogs, news, storage, search, and print services. Rather than limiting the discussion of photography to the production of the photographic image itself, we explore in written assignments how the reception of images can change based on context, usage, and network dynamics. While we rely on required DSLR digital cameras to produce images for weekly photographic assignments, we also experiment with alternate digital image generation techniques from telescopes to microscopes. All coursework will be posted and discussed online, as well as in weekly lectures, workshops, and critiques. Course readings cover the history of photography, the theory of photographic reproduction, and the theory of networking and metemic dissemination. (F,SP) Niemeyer

23. Digital Media Foundation. (4) Three hours of lecture and six hours of studio per week. Server-based art course introduces principles of digital media creation from program to poetry through a combination of lectures, creative projects, and critiques. Topics include basic units of digital media, video, audio, and interactivity authoring; digital cinema; scripting; interactive art; web cam; and net art. Final project is a project which is physically exhibited. All course resources, projects, and reviews are web-based. Lec-
117. Drawing and Composition. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8 and 12; and one from 13, 14, 16, 23, or equivalents. Advanced drawing and composition, color and black-and-white, primarily on paper. 117 or 118 is required of all art majors. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

118. Figure Drawing. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8 and 12; and one from 13, 14, 16, 23, or equivalents. Emphasis on the representation of the human body in various stages of development. Out-of-class experiences include the use of digital camera and scanning. Students are also introduced to the use of computer-aided devices for figure drawing. The course is offered to majors in the art program. (F,SP) Staff

119. Global Perspectives in Contemporary Art. (Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: For declared art practice majors. This course is designed to explore a range of contemporary art movements around the globe, through a closer look at their central ideas, artists, and artworks, as well as the preconditions and broader social context in which the work is being produced. Topics covered will range from the emergence of localized avant-garde movements in the United States and Latin America to the implicit globalization of the international biennial circuit. (F,SP) Staff

120. Approaches to Printmaking: Intaglio. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, 14, 16, or equivalents. An opportunity to discover what an artist can do with an etching press and a familiarity with such processes as etching, drypoint, aquatint, color, and monotype printing. The difference in the ways that these mediums enhance and condition your ideas will be made clear through individual and group critiques. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

122. Approaches to Printmaking: Lithography. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, 16, or equivalents. In the course of making lithographs, you will be encouraged to find an aesthetic direction of your own. Your instructor will also help you develop skills in using both stone and metal plates. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

123. The Language of Printmaking-Screenprinting. (Course may be repeated for credit. Six hours of lecture and three hours of studio per week. Prerequisites: Open to upper division art majors or by consent of instructor. Students will be introduced to the techniques and varied applications. (F,SP) Staff

124. Advanced Projects in Printmaking. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8 and 14, or equivalents. A survey intended to familiarize students with and provide experience in the use of traditional printmaking techniques and materials. Students will focus on a deeper exploration of the current state of printmaking while also engaging in studio projects that involve the use of new materials. (F,SP) Staff

125. Special Topics in Visual Studies. (Course may be repeated for credit. Three hours of lecture and three hours of laboratory per week. Prerequisites: 8, 12, and 14, or equivalents. This class will be more advanced in instruction in the use of non-traditional tools for artmaking such as video and film. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

126. Moving Image Media Production. (Course may be repeated for credit. Three hours of lecture and seven hours of studio per week. This course provides students with the technological and conceptual groundwork for advanced courses in video art and filmmaking. Lectures and discussions will focus on the use of technologies such as video cameras, sound recording, basic lighting techniques, digital editing, compression, and online dissemination. As we work to understand what makes compelling moving images, you will be taught powerful interplay of sound and image. This course is a rubric for all one- and two-credit independent study courses on a two-hour studio per week. Must be passed/not passed with a grade of C or better. (F,SP) Staff

26. Directed Group Study. (1-2) Course may be repeated for credit. Three hours of studio work per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Open to freshmen and sophomores. This is a student-initiated course to be offered for academic credit. The subject matter will vary from semester to semester and will be taught by designated faculty under the supervision of the faculty sponsor. Topics to be related to art practice. (F,SP) Staff

99. Supervised Independent Study. (1-2) One to two hours of independent study per week. Must be taken on a passed/not passed basis. This course will be a rubric for all one- and two-credit independent study courses in art practice that concentrate on the practical aspects of art production. Some students will study gallery work by participating in every phase of producing art exhibitions—from selecting works to hanging and insuring them. Other students will learn concepts, skills, and information they can use in their major courses. All students gaining credit from these courses will attend at least three short term papers analyzing their experiences and reflecting on the principles involved in their work. (F,SP) Staff

Upper Division Courses

102. Approaches to Painting. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 13, or equivalents in courses on color and composition. An introduction to the aesthetic and intellectual processes involved in color and composition, and their relation to human experience. While faculty contact with students is highly individualized, the course involves group critiques and lectures as well as assigned field trips. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

124. Advanced Projects in Printmaking. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, 14, 16, 23, or equivalents. Emphasis on the representation of the human body in various stages of development. Out-of-class experiences include the use of digital camera and scanning. Students are also introduced to the use of computer-aided devices for figure drawing. The course is offered to majors in the art program. (F,SP) Staff

130. Approaches to Sculpture: Concept and Construction. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 14, or equivalents. This class will be more advanced in instruction in the use of non-traditional tools for artmaking such as video and film. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

132. Approaches to Sculpture: Ceramics. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 14, or equivalents. An opportunity to explore the many ways of shaping and decorating ceramic forms in wet clay, then making it permanent by firing it. Illustrated talks will examine the ideas that have engaged ceramic sculptors in many traditions and the processes that they have used to expand them. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

133. Approaches to Sculpture: Meaning in Material. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 14, or equivalents. This class will investigate the possibilities and potentials of sculptural material, both physically and conceptually. We will focus on a deeper exploration of the current state of sculpture with various media. Students will engage in multiple advanced assignments in fabrications, including the wood and metal shops. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

137. Advanced Projects in Ceramic Sculpture. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 14, or equivalents. Students who are experienced in clay may enroll in this course to further develop and expand their knowledge of ceramic materials and processes. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

138. Approaches to Sculpture: Installations. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 14, or equivalents. In this class, we will consider sculptural issues of (and beyond) the object itself. Through this class we will consider how an object is distinct from its environment or is part of it. We will also question issues of space, placement, installation, context, and public interaction. Students will engage with a variety of sites, and with drawing as a form of critical analysis, and on and off campus, with drawing as a form of critical analysis, and in the development and implementation of projects that explore the relationship between sculpture and public space. (F,SP) Staff

141. Temporal Structures: Video and Performance Art. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8 and 12; and one from 13, 14, 16, 23, or equivalents. Projects are aimed at understanding and invention in new ways to transform the body and space into key elements in an artwork. Regular screenings of professional tapes will illustrate uses of the mediums and provide a historical context. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

142. New Genres. (Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8 and 12; and one from 13, 14, 16, 23, or equivalents. A survey intended to familiarize students with and provide experience in the use of non-traditional tools for artmaking such as video and film. Lectures and demonstrations introduce students to techniques and varied applications. (F,SP) Staff

160. Special Topics in Visual Studies. (Course may be repeated for credit. Three hours of lecture and three hours of laboratory per week. Prerequisites:
Consent of instructor. Topics of concern to the instructor, usually related to current research, that may fall outside of the normal curriculum or be of more relevance to upper division students. Regular studio courses provide students with an opportunity to investigate topics and mediums on an ad hoc basis when there is a compelling reason to do so. Provided there is no other course that deals with the same required topics, courses are primarily intended for advanced undergraduates and graduates in art practice but open to others. For special topics and enrollment, see listings outside of 345 Kroeber. (F,SP)

162. Issues in Cultural Display: Studio and Post-Studio Art Practices. (4) Four hours of lecture and two hours of studio per week. Prerequisites: Course is a seminar designed to engage in “close readings” of contemporary art-making and curatorial practices. Through weekly studio visits with artists and curators, the course examines the practical methods, historical origins, philosophical roots, and political and aesthetic implications of each maker’s practice. Readings and discussions will focus on (though not be limited to) issues concerning the interaction of aesthetics and ethics; culture and capital; copyright law; art and craft; singular vs. collective authorship. (SP) Walsh

164. Art and Meditation. (4) Four hours of lecture per week. Prerequisites: Completion of all lower division courses in major. Meditation is arguably the most ancient, powerful, and yet simple spiritual practice in the world. It is known in various forms in nearly all cultures and plays a part in every religious tradition. The class will examine how we can affect your art both in terms of practice and content. The class will be structured with slide presentations, museum visits, discussion of reading, and review of student work. Art from various contemplative traditions will be examined. (F) Sherwood

165. Art, Medicine, and Disabilities. (4) Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, and 23, or equivalents. This advanced studio course is designed for students who have mastered basic skills and concepts involved in digital video production and are interested in further investigating critical, theoretical, and creative research topics in digital video production. Each week will include relevant readings, discussing, and student projects. Each week will include relevant readings, discussions, guest speakers, demonstration of examples, and studio time for training and working on student assignments. (F,SP) Staff

172. CGI Animation Studies. (4) Course may be repeated for credit. Three hours of lecture and six hours of studio per week. Prerequisites: 12, 160, 170, 23, or equivalents. Motion is a ubiquitous element of human experience, yet attempts to explain it remain incomplete. The representation of motion with technology is increasing and changing. This course will focus on computer visualizations of celebrative movements in antiquity and leading to dynamic computer graphics simulations of molecular processes today. In this production-intensive studio course, we will study computer graphics for motion simulations, or animations. We will also probe the tools for their use in creative expression and analyze their impact on cinematic creation and experience. (SP) Staff

173. Sound Art. (4) Course may be repeated for credit. Six hours of studio per week. Prerequisites: 8, 12, 160, 170, and 23, or equivalents. This is a studio designed to introduce artists to the medium of sound. Students will learn the basic skills necessary to work with audio, including microphones, audio recording and mixing, speaker and installation design, and circuit-bending. In addition, students will learn about the history of sound art and the ways in which visual art and experimental sound practice intermingle and expand upon each other. (F,SP) Staff

174. Advanced Digital Video. (4) Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, 160, 170, and 23, or equivalents. This advanced studio course is designed for students who have mastered basic skills and concepts involved in digital video production and are interested in further investigating critical, theoretical, and creative research topics in digital video production. Each week will include relevant readings, discussions, guest speakers, demonstration of examples, and studio time for training and working on student assignments. (F,SP) Staff

174. Advanced Digital Video. (4) Four hours of studio per week. Prerequisites: 100, 165, 186, and 23, or equivalents. This advanced studio course is designed for students who have mastered basic skills and concepts involved in digital video production and are interested in further investigating critical, theoretical, and creative research topics in digital video production. Also listed as Film and Media C187. (F,SP) Staff

175. Advanced Computer Graphics Production. (4) Three hours of lecture and six hours of studio per week. Prerequisites: 8, 12, 160, 170, and 23, or equivalents. This course provides an introduction to the skills, theories, and concepts used in digital video production. Nonlinear and nondestructive editing methods used in digital video are defining new “architectures of time” for cinematic creation and experience, and offer new and innovative possibilities for authoring new forms of the moving image. This course will expose students to a broad range of industry-standard equipment, film and video history, theory, terminology, field, and post-production skills. Students will be required to technically master the digital media tools introduced in the course, and personalize the new possibilities digital video brings to time-based art forms. Also listed as Film and Media C185. (F,SP) Staff

C178. Game Design Methods. (4) Two hours of lecture and two to four hours of laboratory per week. Prerequisites: 23AC, 165, and 172A. This course offers an introduction to game design and game studies. Game studies has five core elements: (1) the study of games as culture generators; (2) the study of playful and interactive artifacts; (3) the study of games as symbolic systems; (4) the study of games as artifacts; and (5) the design of games. One process that is crucial to all these elements is to play. We will study the elements of games, play, testing, and the study of people playing. There will also be a close examination of classical game studies as well as practice-oriented texts. The final exam for this course is to design, test, and evaluate a playable game. Also listed as Film and Media C181. (F,SP) Staff

C179. Mobile City Chronicles: Gaming with New Technologies of Detection and Security. (5) Three hours of lecture and one hour of studio per week. Prerequisites: the city through cases of 19th- and 20th-century urban design, urban practice, and urban studies. The class will study the practices of game development and design, and consider the implications of playing with games. Attention will be paid to emerging technologies, advanced game design, and gameplay. (F) Staff

185. Senior Projects/Professional Practices. (4) Three hours of lecture and three hours of studio critique per week. Prerequisites: Senior-level students only. This course provides students with a foundation for continuing their design and development within a discipline. Critical thinking, readings, guest artists, and field trips, students will explore the practical and conceptual components of their media practice and realize in the production of a broader discussion of artistic production. In addition to this focused attention on the critique process, the class will address the ongoing needs of supporting one’s work within a community of artists, arts professionals, and arts organizations. Each student will work towards developing the most effective tools for communicating their work to these broader audiences using strategies that are appropriate for their ideas, media, and audience. (F,SP) Staff

H195A-H195B. Special Study for Honors Candidates in the Practice of Art. (4,4) Course may be applied toward major requirements. Hours to be arranged. Prerequisites: Eligibility for admission to the Honors Program. Honors students are required to take three units of H195A. They may elect to take an additional three units (H195B) the following semester. (F,SP) Staff

198. Directed Group Study. (1-3) Course may be repeated for credit as many times as noted by the student. Prerequisites: Film 25A and 28A or 28B with a grade of B+ or better and consent of instructor. This hands-on studio course is designed to present students with a foundation-level introduction to the skills, theories, and concepts used in digital video production. Nonlinear and nondestructive editing methods used in digital video are defining new “architectures of time” for cinematic creation and experience, and offer new and innovative possibilities for authoring new forms of the moving image. This course will expose students to a broad range of industry-standard equipment, film and video history, theory, terminology, field, and post-production skills. Students will be required to technically master the digital media tools introduced in the course, and personalize the new possibilities digital video brings to time-based art forms. Also listed as Film and Media C181. (F,SP) Staff

C197. Game Design Methods. (4) Two hours of lecture and four hours of studio per week. Prerequisites: 23AC. This course offers an introduction to game design and game studies. Game studies has five core elements: (1) the study of games as culture generators; (2) the study of playful and interactive artifacts; (3) the study of games as symbolic systems; (4) the study of games as artifacts; and (5) the design of games. One process that is crucial to all these elements is to play. We will study the elements of games, play, testing, and the study of people playing. There will also be a close examination of classical game studies as well as practice-oriented texts. The final exam for this course is to design, test, and evaluate a playable game. Also listed as Film and Media C181. (F,SP) Staff
History of Art

Office: 416 Doe Library #6020, (510) 643-7290
architecture@berkeley.edu
Chair: Christopher Hallett, Ph.D.

Professors
Whitney Davis, Ph.D. Harvard University. Ancient, modern, and theory of art history.
Darzy Gimaldo Grigsby, Ph.D. University of Michigan. European art.
Christopher Hallett, Ph.D. University of California, Berkeley. Roman art.
Margarettta Lovell, Ph.D. Yale University. American and British art.
Andrew F. Stewart, Ph.D. Cambridge University. Greek and Roman art.
Svetlana Alpers (Emerita), Ph.D. James Cahlil (Emeritus), Ph.D.
Jacques de Caso (Emeritus), Ph.D. Loren Partington (Emeritus), Ph.D.
Peter H. Selz (Emeritus), Ph.D. D.F.A. (hon.) Anne M. Wagner (Emerita), Ph.D.
Joanna Williams (Emerita), Ph.D.
David H. Wright (Emeritus), Ph.D.

Associate Professors
Patricia Berger, Ph.D. University of California, Berkeley. Chinese art.
Marian Feldman, Ph.D. Harvard University. Art history, Near Eastern studies.
Elizabeth Honig, Ph.D. Yale University. European art.
Todd Ozso, Ph.D. University of Michigan. Early modern European art.

Assistant Professors
Silvana Angelova, Ph.D. Harvard University. Early Christian and Byzantine art.
Beate Fricke, Ph.D. University of Trier. Medieval art.

Staff

The Major

The major offers an introduction to the history of the visual arts in Western and Asian cultures as well as the opportunity of a special study of areas of the student’s choice. Fundamentally, a humanistic inquiry and often multidisciplinary in approach, the field provides majors with essential skills in historical and critical thinking, research and critical skills needed for many specialized professions. Majors frequently go on to careers in business, law, or the arts as well as graduate study in the history of art. Opportunities for teaching, museum work, and conservation.

Within the broad field of art history each undergraduate major develops an area of special competence or focus, defined by a cluster of courses: upper-division course fulfillment. Once a breadth requirement, one seminar, one related upper division course outside the department, and one further upper division course in the history of art. This individual focus can be defined as an art history subfield (Medieval, Japanese, or Modern, for instance), by genre (portrait or landscape painting, or architecture), or thematically (Buddhist art, women artists, art in an architectural context, art, and narrative, etc.). The major advisor will focus on one or more of the course clusters as the student’s coursework focuses; it often is a course in history, literature, philosophy, or religious studies. It requires the prior approval of an undergraduate advisor and should be taken as soon as the student’s focus is defined, not left until the final semester.

How and When to Declare the Major. Students are admitted to the major only after successful completion (with an average of C or 2.0) of at least two courses in the history of art at Berkeley (either lower-division or upper-division). Once these prerequisites are met, students may formally petition to declare the major by making an appointment to see an undergraduate faculty advisor at any time during the fall and spring semesters. (Students in residence are strongly urged to complete all lower division requirements and one upper division course by the end of their sophomore year.)

Advisory, Declared majors must see an undergraduate advisor at least once each year during the registration period. These advising meetings provide majors with the opportunity to work closely with a faculty member who can help them develop the courses necessary to best suit their individual strengths, weaknesses, and career goals. The advisers also arrange majors for special courses and opportunities, both in the Department of History of Art and in other departments. 

Departmental undergraduate advisers do not administer or approve coursework or degree requirements in the College of Letters and Science other than the requirements of the major. For L&S requirements, students should make an appointment to see an L&S adviser in 113 Campbell.

Course credit may be given to students who take one or more of these courses. Transfer students should come to their first advising meeting with transcripts from all institutions they have attended to discuss their plans and to obtain an adviser. Your performance will be evaluated by your adviser upon your return to determine whether major requirements have been satisfied.

Suggested Restriction. AP Credit. Course credit may be given to students who achieve a score of four or five on the Advanced Placement Examination in history of art. This credit may be used in place of either History of Art 10 or 11 to satisfy one of the lower division course requirements in the major. Suggested All Majors. 

(1) Foreign languages are not required in lower or upper division courses, but a reading knowledge of German, French, Italian, or Latin may be helpful in seminars and other research courses.

(2) Recommended course load in the history of art will vary according to the student, course level, and individual course requirements. In general, no more than two history of art courses per semester are recommended.

(3) Special programs, such as study abroad, internships, and double majors, are also encouraged and are recommended. If you are interested in any of these, discuss your plans early with your adviser.

Note: Courses taken through study abroad must be discussed in advance with an adviser and will not be formally approved until after completion and until satisfactory documentation has been submitted. In order for courses taken abroad to satisfy major requirements, the breadth and depth of the course, and the work completed in them, must be acceptable to your adviser.

(4) Students with special intellectual or preprofessional interests may wish to enroll in independent study or research courses (193, 199), in a second seminar (192), or in an additional, related major or minor. Students interested in other departments or other degree programs should discuss their interests with their advisers as early as possible.

Special Restrictions: Letter grade: All courses to be counted toward completion of the major must be taken for a letter grade except for the lower-division studio art
must be in Asian art unless the student has already taken a lower division course in this field.

(2) Two additional upper division courses in the history of art, one of which must be a seminar. (No independent study courses.)

(3) One upper division course outside the department, representing the student’s main focus of study. This course should have a historical or theoretical focus that informs a student’s emphasis in the history of art. It must be approved in advance by a departmental undergraduate major adviser.

The Minor

The minor program is designed to provide a structured and broad program for those students majoring in other disciplines but with a strong interest in the history of art. The requirements for the minor program are as follows:

1. Breadth Requirements: Five upper division courses, covering at least three of the six fields of art history as taught in this department: Asian, Ancient, Medieval, Renaissance, Baroque, and Modern. One of the five courses may be a seminar (192); the rest must be lecture courses.

2. Recommended: Minor program students are also strongly urged to take two lower-division survey courses (11, 30, 31, 34, 35, 40, 41, 51, 62, etc.) and one course in the practice of art, preferably drawing.

3. Residency Requirements: A minimum of three of the required upper division courses must be taken at Berkeley.

4. Grades: All courses to be applied toward the minor program must be taken for a letter grade. A minimum GPA of 2.0 is required in all courses applied to the minor.

Note: Work for the minor must be completed within the 130-unit minimum limit for graduation. Courses accepted for a minor program may also satisfy the College of Letters and Science Breadth requirements. A maximum of one course may be used.

Lower Division Courses

R18. Reading and Writing about Visual Experience.

Introduction to Western Art: Renaissance to the Present. (4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing Requirement, English 1A, or equivalent. Formerly 1B. How do mechanisms of perception structure responses to visual art? What is at stake when words describe images? By means of intensive looking, thinking, speaking, and writing, this course introduces students to a series of problems and issues in the description and analysis of works of art. Because it introduces the student to the historical study of art, it is intended for students with no previous coursework in the field. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

10. Introduction to Western Art: Ancient to Medieval. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: May follow 1B or precede 11, though neither is required. Formerly 10A. An introduction to the art of Egypt, Greece, Rome, and the European Middle Ages. Works of painting, sculpture, and architecture are presented chronologically and interpreted within their particular historical circumstances. The course focuses on themes such as the social function of art, strategies of realism and abstraction, rhetorics of the material and immaterial, patronage and the construction of viewing, etc. It enables students to acquire the perceptual and critical skills to enjoy, interpret, and question works of art. Like 11, this course is recommended for potential majors and for students in other disciplines, both humanities and sciences. (F,SP)

11. Introduction to Western Art: Renaissance to the Present. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: May follow 1B or 10, though neither is required. Formerly 10B. An introduction to the historical circumstances and visual character of Western art from the Renaissance to the present. Not a chronological survey, but an exploration of topics and themes central to this period. For example: What tasks did painting and sculpture perform in the past? For whom? How did the rise of landscape painting, the cult of the artist, and the new emphasis on the nude relate to the emergence of modern society? Do stylistic labels like Classicism, Realism, Impressionism, and Modernism help us answer such questions? This course is recommended for potential majors and for students in other disciplines, both humanities and sciences. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore art. A faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics may vary from department to department and semesters to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

29. Prehistoric and Archaic Art. (4) Three hours of lecture per week. Introduces prehistoric and archaic arts (art in Paleolithic, Neolithic, prehistoric societies; art in early phases of complex civilizations), including Early Art (Lascasas, rock art, megalithic construction (Stonehenge), and ritual objects (the Narmer Palette). Examples drawn from Europe, northern and southern Africa, Egypt and Near East, northern and central Australia, and the Southwest and Northwest Coast in North America. (F,SP)

30. Art of India. (4) Three hours of lecture and one hour of discussion per week. This course surveys the arts of India from 2000 BC to the present, including painting, sculpture, and haptic-and prehistoric material (Indus Valley), Buddhist sculpture and painting, Hindu temples and their images, miniature painting, and modern art. Art will be considered in relation to its religious, political, and social contexts. The course will normally focus on major monuments, seen from multiple viewpoints, or upon problems and issues that relate the area of this tradition to other parts of the world (or differentiate it from them). No previous background is presumed, and students will be introduced to basic art-historical methods of viewing and analysis. (F,SP)

32. The Arts of Korea. (4) Three hours of lecture and one hour of discussion per week. This course will introduce the arts and culture of Korea from the pre-historic period through the early 20th century. Significant examples of painting, ceramics, sculpture, metalwork, and photography will be closely examined. Introduces Korean philosophy, religion, and culture. Korean art will also be presented in its East Asian context and compared to Chinese and Japanese art. No prior knowledge of Korean art or history, or Chinese or Korean languages, is expected. (F,SP) Kim

34. Arts of China. (4) Three hours of lecture and one hour of discussion per week. An introduction to the arts of China, designed for newcomers to the history of art or to the study of Chinese culture. Lectures will survey six millennia of Chinese art thematically and chronologically, including the burial arts of the Neolithic period through the Tang dynasty (4th BCE-10th C. CE), Buddhist and Daoist ritual arts, and painting and calligraphy. Lectures, readings, and discussions will introduce students to various systems of Chinese thought, modes of visual analysis, and art historical method. (F,SP) Berger

35. Art and Architecture in Japan. (4) Three hours of lecture and one hour of discussion per week. This course is an introduction to Japanese art and architecture in Japan. It is intended for newcomers to the history of art and/or to the study of Japanese history and culture. Lectures will proceed chronologically, beginning with the archaeological and geological periods and tumuli of prehistoric Japan and ending with the popular graphic arts of the 17th to 19th centuries and modern transformations of art. (F,SP)
106. Theories and Methods of Art History. (4) Three hours of lecture and one hour of discussion per week. How art has been studied in the past and how it is currently studied, its historiography and methodology. Consideration of the earliest writers (Pliny, Vasari) but also modern approaches, from traditional style analysis and connoisseurship through the "founders" of modern art history (Panofsky, Riegl) to more recent approaches, e.g. psychoanalysis, feminism, social history, anthropology, semiotics, etc. 

107. Gender and Representation. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. A consideration of historical and theoretical issues posed for visual media by attention to issues of gender. Previous coursework in art history recommended. Detailed descriptions of current and future offerings available in room 416 Doe Library. 

108. Cities and the Arts. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. The study of various urban centers at particular times in relation to the art produced there. Emphasis may be placed on the rise of artistic centers and professional communities; the representation of ideas of power, learning or recreation; the construction of urbanity; the reaction to cities, etc. Detailed descriptions of current and future offerings available in room 416 Doe Library. (F,SP) 

120A. The Art of Ancient Mesopotamia: 3500-1000 BCE. (4) Three hours of lecture and one hour of discussion per week. Offered in all campus departments the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments, and their topics vary from semester to semester. 

41. Introduction to Greek and Roman Art. (4) Three hours of lecture and one hour of discussion per week. An introduction to the major works, themes, and agendas of Greek and Roman art and architecture. Participants will learn to appreciate the conceptual and critical skills necessary for understanding these works; to analyze and interpret them; and to relate them to broader historical trends in art and architecture. 

120B. The Art of Ancient Mesopotamia: 1000-330 BCE. (4) Three hours of lecture and one hour of discussion per week. The royal art and architecture of ancient Mesopotamia will be explored in terms of the social, political, and cultural context of the great empires of Assyria, Babylon, and Persia. The course provides an integrated picture of the arts of Mesopotamia and neighboring regions from 3500-1000 BCE with an emphasis on the development of visual narrative, the use of art in the expression of authority and legitimacy, and artistic interconnections on the campus or in the area will be incorporated whenever possible. Also listed as Near Eastern Studies C120A. 

C121B. Topics in Islamic Art. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. The course will trace the development of architectural and Islamic art. Subjects addressed may include painting, calligraphy, and book production. Also listed as Near Eastern Studies C121B. Open to nonmajors. General prerequisites: Upper division status of the instructor. Unless otherwise stated, the A part of a sequence is not prerequisite to the B part. 

130A. Early Chinese Art, Part I. (4) Three hours of lecture and one hour of discussion per week. Chinese art of the Neolithic and Bronze Age. From the earliest period to the end of the Han dynasty (early third century A.D.), especially ceramics, bronzes, jade, and lacquer. 

131A. Early Chinese Painting. (4) Three hours of lecture and one hour of discussion per week. The history of Chinese pictorial art and painting from the beginnings in the late Chou dynasty through the Sung dynasty (4th century B.C. to A.D. 1270), with concentration on the later periods (10th-13th centuries). 

131B. Later Chinese Painting. (4) Three hours of lecture and one hour of discussion per week. The history of Chinese painting in the Yuan, Ming, and early Ch'ing dynasties (14th-17th centuries). (F,SP) 

134. Topics in Buddhist Art and Architecture. Three hours of lecture and one hour of discussion per week. (F,SP) Levine 

134A. Buddhist Temple Art and Architecture in Japan. (4) Primarily the architecture and sculpture of Japanese Buddhist temples and shrines. (F,SP) 

134B. Buddhist Icons in Japan. (4) This course introduces the study of Buddhist icons in Japan, principally paintings and sculpture but also texts, within broader Buddhist ritual and visual cultures from ca. 500 CE to the early 20th century. (F,SP) 

134C. Buddhist Art in the Modern/Contemporary World. (4) This course analyzes the art, architecture, and archaeology of the Buddha and other Buddhist deities in the modern and contemporary world, including pre-modern works of painting and sculpture, images made by contem- porary artists, and images within popular culture. (F,SP) 

136A. The Art of India: Indus Valley Through 550 A.D. (4) Three hours of lecture and one hour of discussion per week. A survey of Indian art from the Indus civilization through 550 A.D. This class will focus on Buddhist architecture and sculpture with emphasis on the evolution of style and iconography, and problems of dating. 

136B. The Art of India: 500-1350 A.D. (4) Three hours of lecture and one hour of discussion per week. A survey of Hindu sculpture and architecture in India from the sixth to 14th centuries. (F,SP) 

136C. The Art of India: 1350 A.D. to the Present. (4) Three hours of lecture and one hour of discussion per week. A selective survey of major developments in Muslim and Rajput painting from 1350 to the present. 

137. The Art of Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. Offered in all campus departments the opportunity to explore the art of Cambodia, Vietnam, Thailand, Burma, and Indonesia focusing on the period from 400 to 1500 A.D. Sculpture and architecture will be considered as a balance of Indian and indigenous traditions. 

C140. Minoan and Mycenaean Art. (4) Three hours of lecture and one hour of discussion per week. This course analyzes the art, architecture, and archaeology of prehistoric Greece, concentrating on the Minoan and Mycenaean palatial art of the Bronze Age (3000-1200 BCE). The evocative yet still enigmatic remains of palaces and funerary complexes, frescoes and vase paintings, and precious worked pieces will be closely examined in terms of their forms and cultural contexts. The place of prehistoric Greece in the international world of the eastern Mediterranean will also be explored. Also listed as Near Eastern Studies C129. 

141. The Art of Ancient Greece. Three hours of lecture and one hour of discussion per week. In addition to close study of the major works, particular emphasis upon their cultural context and upon key issues such as narrative strategies, gender and the body, modes of address in sculpture and painting, political propaganda in art, and the rise of the creative artist. Special attention, wherever possible, will be paid to newly discovered work. 

141A. Archaic Greek Art and Architecture (750-480 B.C.). (4) The early development of the major genres of Greek art in the era of the emerging city-states. 

141B. Classical Greek Art and Architecture (500-320 B.C.). (4) The maturity of the major genres of Greek art in Periclean Athens and the other leading centers. 

141C. Hellenistic Art and Architecture (330-30 B.C.). (4) A survey of the major genres of Greek art in the Hellenistic world from Italy to India. 

145. Roman Art. (4) Four hours of lecture per week. The art of Rome and of the Roman Empire, from its sources in the Republican era to the Age of Constantine the Great. 

151. Art in Late Antiquity. (4) Hours of lecture per week. Imperial art from Gallienus through the collapse of the Western empire. Christian art from the beginning around 200 through the age of Justinian. Revival in the seventh and eight centuries. A look back from the court of Charlemagne and contemporary Constantinople. 

160. Renaissance Art in Florence 1400-1600. (4) Four hours of lecture and one hour of discussion per week. A selective survey of major developments in Italian Renaissance painting, sculpture, and architecture organized by genre. Particular emphasis on the relationship between art and religion and the ideology of Florentine republicanism and cultural absolutism. Issues of gender, the status of artists, and the function, audience, and patronage of art will also be considered. 

161. Renaissance Art in Rome 1400-1600. (4) Four hours of lecture and one hour of discussion per week. A selective survey of major developments in Roman Renaissance painting, sculpture, and architecture organized by genre. Particular emphasis on the relationship between art and religion and the ideology of a theocratic papacy. Issues of gender, the status of artists, and the function, audience, and patronage of art will also be considered. 

162. Renaissance Art in Venice 1400-1600. (4) Four hours of lecture and one hour of discussion per week. A selective survey of major developments in Venetian Renaissance painting, sculpture, and architecture organized by genre. Particular emphasis on the relationship between art and religion and the ideology of the Venetian commune. Issues of gender, the status of artists, and the function, audience, and patronage of art will also be considered.
U.S. interaction. The culture of the avant-garde, art, and politics in the age of Lenin and Hitler, etc.

186C. Art in the Later 20th Century. (4) Three hours of lecture and one hour of discussion per week. A consideration of major issues in European and American post-war art. Emphasis will be placed on conceptual, video, and performance art as well as traditional media.

187B. Problems in 20th-Century Sculpture. (4) Three hours of lecture and one hour of discussion per week. An examination of critical issues of the 20th century in sculpture. Prerequisites: Consent of instructor and American Cultures requirement. (F,SP)

Lovell

192B. Ancient. (4)
192C. Medieval. (4)
192D. 15th-16th Century. (4)
192E. 17th-18th Century. (4)
192F. 19th-20th Century. (4)
192G. Art and Life in 19th-Century America. (4) Concentration on specific problems or works in a particular area of art history. Assigned readings, discussion, and a substantial paper. This course satisfies the American Cultures requirement.

193. Directed Research. (4) Prerequisites: Consent of instructor and department adviser. Intended for advanced undergraduates wishing to continue research on topics already begun in a lecture or seminar or to pursue at a high level special topics not ordinarily covered in the curriculum. Usually results in a substantial paper. For general independent study, see 199; for honors research, see H195.

194. Museum Internship. (4) Course may be repeated for credit. Ten hours per week, involving a substantial project of a curatorial nature. Jointly supervised by a member of the professional staff of the participating museum and a faculty member. Intensive involvement in museum work must be arranged well in advance. For further information, inquire at 416 Doe Library. (F,SP)

H195. Special Study for Honors Candidates in the History of Art. (4) Individual conferences and thesis. Prerequisites: Senior standing and qualifying scholastic record (3.5 GPA overall and 3.5 GPA in upper division courses completed in the major). Directed study leading to the completion of the honors thesis. Consult the description of the Honors Program in Art History.

C196W. Special Field Research. (10.5) Course may be repeated for credit. Ten hours of fieldwork per week plus conferences. Must be taken on a passed/not passed basis. Prerequisites: Approval of undergraduate adviser; 192H recommended. Study and practicum in one of the traditional media.

198. Supervised Group Study. (1-4) Course may be repeated for credit. Tutorial. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor, major adviser, and department chair. For students wishing to pursue an interest not represented in the curriculum by developing an individual program of study supervised by a faculty member, including readings, projects, papers, fieldwork, etc. For continuing or advanced research projects, see 193.
Graduate Courses

General prerequisites: Graduate standing and consent of the instructor, and possibly courses in the history of art and reading knowledge of languages.

200. Graduate Proseminar in the Interpretation of Art Historical Materials. (4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor. An introduction to the fundamentals of art history, including traditional and innovative perspectives designed for candidates for higher degrees. Offerings vary from year to year. Students should visit the department website for offerings before the beginning of the semester.

201. Seminar in Romanesque and Gothic Art. (3-4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. This seminar looks at both material culture theory and the practice of interpreting objects in the West and in Asia. It draws on the practices and inquiries of multiple disciplines including archaeology, anthropology, cultural geography, and art history. We will consider the variety of ways and contexts in which objects have been understood to "speak" as aesthetic vehicles and as cultural texts. Taught by two faculty members with extensive experience as museum curators—one of American art, the other of Asian art—this class will combine theory with hands-on learning. (F,SP) Berger, Lovell

202. Seminar in Classical Archaeology and Ancient Egyptian Art. (3-4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Working knowledge of Latin, Greek, and German or French or Italian. This seminar is intended to introduce graduate students—both archaeologists and non-archaeologists—to the discipline of classical archaeology, history, and evolution, and its research tools and bibliography. Since it is both impossible and undesirable to attempt to cover the entire discipline in one semester, after two introductory lectures on the history of the field, we will address a selection of topics that seems representative of its concerns. Also listed as Classics C204. (SP) Hallett, Stewart

230. Seminar in Chinese Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor. Topics explore the art and archaeology of China, focusing on its different regional and historical contexts. Offerings vary from year to year. Undergraduate Major Adviser: Mr. St. Germaine (Emeritus), M.A.

234. Seminar in Japanese Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor. This seminar explores the representation of Japanese art in Europe and America, and its role in the development of modernist art. Offerings vary from year to year. Undergraduate Major Adviser: Mr. St. Germaine (Emeritus), M.A.

262. Seminar in European Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

264. Seminar in 20th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

265. Seminar in the Baroque Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

267. Seminar in 19th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

268. Seminar in 20th-Century Painting and Sculpture. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

270. Seminar in Baroque Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

281. Seminar in 19th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

285. Seminar in 20th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

288. Seminar in 20th-Century Painting and Sculpture. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

291. Judith Stronach Graduate Travel Seminar in Asian Diaspora Studies. (2) Course may be repeated for credit. Three weeks of travel to a selected area or site. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

298. Seminar in 20th-Century Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

299. Seminar in American Art. (2,4) Course may be repeated for credit. Three hours of seminar per week plus extensive outside work. May be taken for 2 units on a satisfactory/unsatisfactory basis with consent of instructor. Prerequisites: Graduate standing and consent of instructor.

Professional Courses

300. Teaching the History of Art. (1-5) Course may be repeated for credit. Course does not satisfy unit or residence requirements for master’s degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Individual study, in consultation with the graduate adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. degree. (F,SP)

Undergraduate Program

The Asian American and Asian Diaspora Studies major at Berkeley is dedicated to the multidisciplinary study of historical and contemporary experiences of Asian-ancestry groups in local, national, and global contexts. Although attention is focused on Asians in the United States, the program situates the experiences, contributions, issues, and concerns of Asian American communities within their larger transnational and diasporic contexts. Connections among Asian communities in the United States and around the world are explored in terms of the entangled histories and circuits of migration and the interconnected space through which people, capital, ideas, influences, and activism flow between Asia and the United States and among Asian diasporic communities.
Major Requirements

Lower Division (4 courses): Asian American Studies 20A and 20B; and two courses from the following: Ethnic Studies 10AC, 11AC, 20AC, 21AC, or 41AC.

Upper Division (8 courses): Asian American Studies 131; Ethnic Studies 101A or 101B; and completion of one course from each group below:

Group 1 (History): 121, 122, 123, 124, 125, 126, or 128AC.

Group 2 (Community Studies): 132AC, 141, 143, 144, 145, 146, or 165; and

Group 3 (Cultural Studies): 138, 171, 172, 175, 178, 181, or 183.

Two additional electives that can be satisfied with related courses from outside departments (i.e., History, South and Southeast Asian Studies, Asian Studies); other UC campuses; EAP courses from an Asian university; or Asian language courses; and Asian American Studies 197 (4 units total).

Honors. The Asian American and Asian Diaspora Studies Program will provide a program leading to the A.B. degree with honors. A student will be recommended for honors if the student has completed 30 units and two semesters with a GPA of at least 3.3 for all work undertaken in the Asian American and Asian Diaspora Studies Program. Students must also have been approved specially by appointment of the chair by the Department of Ethnic Studies and the vice chair of the Department of Asian American and Asian Diaspora Studies, upon the recommendation by the faculty adviser for the major. The honors student will be required to complete H195, Senior Honors Seminar, for Asian American and Asian Diaspora studies majors. In order to graduate with a A.B. degree with honors, a student must obtain at least a 3.3 GPA for all coursework undertaken at the University.

The Minor

Requirements. Five elective courses from Asian American Studies: 120, 121, 122, 123, 124, 125, 126, 127, 128AC, 129, 130, 131, 132, 141, 142, 145, 146, 150, 151, 165, 171, 172, 175, 176, 177, 178, 179, 180, 181, 193, 190AC.

Lower Division Courses

R2A. Reading and Composition. (4) Three hours of lecture and one hour of tutorial per week. Prerequisite: 10A or equivalent. Formerly 21A. Three hours of lecture and one hour of discussion per week. Prerequisite: 20A or equivalent. Chinese American history, 1848 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration to the American West; the influence of public policy, foreign and domestic, on the Chinese individual and community. (SP)

R2B. Reading and Composition. (4) Three hours of lecture and one hour of tutorial per week. Prerequisites: 2A, English 1A or equivalent. Formerly 2B. This course introduces students to close textual analysis, fosters critical judgment, and reinforces academic writing skills. Satisies the first half of the Reading and Composition requirement. (F,SP)

R2B. Reading and Composition. (4) Three hours of lecture and one hour of tutorial per week. Prerequisites: 2A, English 1A or equivalent. Formerly 2B. This course introduces students to close textual analysis, fosters critical judgment, and reinforces academic writing skills. Satisies the second half of the Reading and Composition requirement. (F,SP)

20A. Introduction to the History of Asians in the United States. (4) Three hours of lecture and one hour of discussion per week. Introductory comparative analysis of the Asian American experience from 1848 to the present. Topics include an analysis of the Asian American perspective; cultural roots; immigration and settlement patterns; labor, legal, political, and social history. (F,SP)

20B. Introduction to the Contemporary Issues in the Asian American Communities. (4) Three hours of lecture and one hour of discussion per week. An introduction to Asian American communities and the social, economic, and political issues they confront. The diverse range of communities; both suburban and urban, will be surveyed and situated within a domestic and global context. (F)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual community and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

97. Field Studies in Asian American Communities. (1-3) Course may be repeated for credit. Three hours of fieldwork per week per unit. Must be taken on a pass/no pass basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor. University organized and supervised field program involving experiences in schools, school-related activities, community, and community-related activities. (F,SP)

98. Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of the catalog. Three hours of work per week per unit. Must be taken on a pass/no pass basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor. Group study of selected topics that will vary from semester to semester. (F,SP)

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Three hours of independent study per week. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. Individual research on a topic which leads to the writing of a major paper. Regular meetings with faculty sponsor. (F,SP) Staff

Upper Division Courses

121. Chinese American History. (4) Three hours of lecture and one hour of discussion per week. Prerequisite: 20A or equivalent. Chinese American history, 1848 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration to the American West; the influence of public policy, foreign and domestic, on the Chinese individual and community. (SP)

122. Japanese American History. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisite: 20A or equivalent. Japanese American history, 1848 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration to the American West; the influence of public policy, foreign and domestic, on the Chinese individual and community. (SP)

123. Korean American History. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisite: 20A or equivalent. Korean American history, 1876 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration to the American West; the influence of public policy, foreign and domestic, on the Chinese individual and community. (SP)

124. Filipino American History. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisite: 20A or equivalent. Filipino American history, 1848 to present. Topics include influence of traditional values, Eastern and Western; patterns of immigration to the American West; the influence of public policy, foreign and domestic, on the Chinese individual and community. (SP)

128AC. Muslims in America. (4) Three hours of lecture and zero to one hour of discussion per week. The course traces Islam’s journey in America. It will deal with the emergence of identifiable Muslim communities throughout the United States and focus on the nature of Muslim identity. The course will cover patterns of migration, the ethnic makeup of such communities, gender dynamics, political identity, and cases of conversion to Islam. The course will spend considerable time on the African American, Indo-Pakistanis, and Arab American Muslim communities since these, if taken together, constitute the largest groupings. It also examines in depth the emergence of national, regional, and local Muslim institutions, patterns of development pursued by these communities, and levels of cooperation or antagonism. The course seeks an examination of gender relations and dynamics across the various Muslim groupings, and the internal and external factors that contribute to their coexistence. The course seeks to conduct and document the growth and expansion of mosques, schools, and community centers in the greater Bay Area. Finally, no class on Islam would be complete without a critical examination of the impacts of 9/11 on Muslim communities, the erosion of civil rights, and the ongoing war on terrorism. This course satisfies the American Cultural Requirement. (F,SP)

130. Asian American and Foreign Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisite: 20A or consent of instructor. This course is an introduction to the political, economic, and cultural relations between the United States and Asia and the implications for Asian American communities. In analyzing interstate relations, students will gain insight into U.S. policies and interests in Asia-Pacific and the interplay of internal and external forces that shaped the Asian American community and, within a theoretical examination of the impacts of 9/11 on Muslim communities, the erosion of civil rights, and the ongoing war on terrorism. This course satisfies the American Cultural Requirement. (F,SP)

131. Asian Diaspora(s) from an Asian American Perspective. (4) Three hours of lecture and zero to one hour of discussion per week. Analyzes the global spread of the Asian American population: migration/settlement history, transnational economic/political/cultural interactions between diasporic communities and with land of origin, impact on Asian American community and culture, and role of the Asian American community and culture in the United States. (SP)

prefix=language course for business majors
prefix=course satisfies R&c requirement
prefix=course satisfies American Cultures requirement
prefix=online course
prefix=Graduate School
prefix=Recipient of Distinguished Teaching Award
132. Islamophobia and Constructing Otherness. (4) Three hours of lecture and zero to one hours of discussion per week. This course will examine and attempt to understand Islamophobia, as the most recently articulated principle of otherness and its implications domestically and globally. The course will also closely examine the ideological and epistemological frameworks through which we construct others; and the complex social, political, economic, gender-based, and religious forces entangled in its historical and modern reproduction. (F,SP) Staff

132AC. Islamophobia and Constructing Otherness. (4) Three hours of lecture and zero to one hours of discussion per week. This course will examine and attempt to understand Islamophobia, as the most recently articulated principle of otherness and its implications domestically and globally. The course will also closely examine the ideological and epistemological frameworks through which we construct others; and the complex social, political, economic, gender-based, and religious forces entangled in its historical and modern reproduction. This course satisfies the American Cultures requirement. (F,SP) Staff

138. Topics in Asian Popular Culture. (4) May be repeated for credit. Three hours of lecture per week. Topics in Asian popular culture; analysis of historical and contemporary issues addressed in popular media in Asia. Staff

141. Law in the Asian American Community. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 20A or 20B. Course will examine the nature, structure, and operation of selected laws as they affect Asian American communities and will attempt to analyze the roles and effects of law, class, and race in American society. May be taken with 197. (F,SP)

143. Asian American Health. (3) Three hours of seminar per week. This course examines the state of Asian American health; the historical, structural, and cultural contexts of diverse Asian American communities; and the role of race, ethnicity, and socioeconomic status in the production of unequal outcomes between Asian Americans and other racial/ethnic groups as well as across different Asian American subgroups. (F,SP) Staff

144. Religions of Asia. (4) Three hours of lecture per week. This course will examine how Asian American religious groups engage religion and how, in turn, they are shaped by the different facets of religious life. Religion is examined in the form of major traditions—Buddhism, Islam, Hinduism, Sikhism, Christianity—and introduced students to key cultural theories and American film history and a contribution to evolving Asian American cultural nationalism. (SP)

176. Genre in Asian American Literature. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Advanced seminar in Asian American literature; analysis of historical and contemporary issues addressed in popular media in Asia. Staff

177. Asian American Art: Remapping Modernity: Art and Artists in the 20th Century. (3) Three hours of seminar per week. Seminar in contemporary Asian American visual art, with focus on the politics of production and reception of art, with emphasis on Y. David Chung, Hung Liu, Yong Soon Min, Long Nguyen, and Manuel Ocampo will be studied. (F,SP) Staff

180. Chinese-Language Literature and Film on the Immigrant Experience. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20A or 170 and consent of instructor. Analyzes prose narratives by Asian American writers that prominently feature the crossing of national borders. Explores sociohistorical factors in displacement; gender, nation-state, and subjecthood; multiple migrations; constructions of home; polychronial, postmodernist, diasporic, and globalized views of transnational movement. (F,SP)

181. Chinese American Literature. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: Consent of instructor. Analyzes literary representations of contemporary and/or historical experiences of Chinese Americans; genre, formal, and stylistic features; definition of cultural identity and development of literary tradition. Primarily English language works, some translations from Chinese. (F,SP)

190. Seminar on Advanced Topics in Asian American Studies. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced seminar in Asian American studies with topics to be announced at the beginning of each semester. (F,SP)

190AC. Seminar on Advanced Topics in Asian American Studies. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. Advanced seminar in Asian American studies with topics to be announced at the beginning of each semester. This course satisfies the American Cultures requirement. (F,SP)

195. Senior Thesis. (4) Independent study. Prerequisites: Consent of instructor. Writing of a thesis under the direction of member(s) of the faculty. (F,SP) Staff

H195A-H195B. Senior Honors Seminar for Asian American Studies Majors. (3,3) Credit and grade to be awarded on completion of sequence. Prerequisites: Approval of faculty committee; 3.3 GPA on all University work and a 3.3 GPA in courses in the major. Formerly H195. Research seminar for senior Asian American studies majors designed to support and guide the writing of a senior thesis. (F,SP) Staff

197. Field Study in Asian American Communities. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. University organized and supervised field program involving experiences in schools, school-related activities, community, and community-related activities. (F,SP) Staff

198. Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected topics that will vary from semester to semester. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Individual research on a topic that leads to the writing of a major paper. Regular meetings with faculty sponsor. (F,SP) Staff
Asian Studies

(College of Letters and Science)

Undergraduate Office: 101 Stephens Hall, (510) 642-0333
Graduate Office: 2223 Fulton Street, Room 524, (510) 642-0333
leas.berkeley.edu
Chair and Head Adviser: Bonnie C. Wade, Ph.D.
Faculty Advisory Committee
Martin Backstrom (Institute of East Asian Studies)
Jurgen Habu (Anthropology)
Jeffrey Hadler (South and Southeast Asian Studies)
Xin Liu (Anthropology)
Michael Nylan (History)
Bonnie Wade (Chair, (Music)

Group Major in Asian Studies

The undergraduate Group Major in Asian Studies is a rigorous but flexible interdisciplinary program designed to assist students to take advantage of the rich course offerings in the Asian field campus-wide in a way that is not available through individual departments. There are three concentrations from which a student may select in the major: (1) a Multi-Area thematic concentration, (2) a concentration on China, and (3) a concentration on Japan. “Multi-Area” includes all countries and regions of Asia. One of the areas chosen must be either China or Japan; other areas can include Korea and countries in South Asia or Southeast Asia.

Prerequisite Courses in the Major

Students petitioning to enter the Group Major in Asian Studies must have completed (grade C or better) the following:
(1) Asian Studies 10, Introduction to Asia (offered in the fall only).
(2) One lower-division history course (choose one): History 6A (China, Early empires); History 6B (Modern China); History 11 (India); History 14 (Japan); SEAsian 10A (Southeast Asia—mainland); SEAsian 10B (Southeast Asia—insular).

Additional Major Requirements

Once accepted into the major, the student is expected to select one of three concentrations: Area I (Multi-Area); Area II (China); or Area III (Japan). For Area I, one area must include either China or Japan with others including Korea, countries of Southeast Asia or South Asia. The following coursework is required:
(1) Two years of language appropriate to the concentration. After the second year, further study of the language at the upper division level is encouraged and will count toward the major unit requirements. In the Multi-Area thematic concentration, the language will be Chinese or Japanese, as appropriate.
(2) Completion of a minimum of 30 units of upper division coursework.
(3) Two upper division courses in the same discipline. One of the two must be a course whose primary purpose is to introduce the theories and methods of the discipline.
(4) One upper division course must be a course in a discipline appropriate to the student’s concentration.
(5) Five Inter-Area/Interdisciplinary courses. In the concentration on Area I (Multi-Area), the student will create his/her own emphasis in the form of a thematic topic course can be pursued through five courses on countries and regions of East Asia, Southeast Asia, and South Asia. In the concentration on Area II (China), three out of the five courses must be on China. In the concentration on Area III (Japan), three out of the five courses must be on Japan.

Area Focus

At the time of declaring the major, the student identifies the concentration of Area I, II, or III. For the Multi-Area concentration, students must submit a statement detailing a theme or topic that will be pursued and a potential list of courses that are pertinent to the plan of study.

Multi-Area. Students with a Multi-Area thematic concentration must take (in addition to the prerequisite courses of Asian Studies 10 and a lower division history course):
(1) Two years of either Chinese or Japanese. Students who choose China as one of their areas must take Chinese; students who choose Japan as one of their areas must take Japanese.
(2) Disciplinary focus: one upper division Theory and Methods course and one upper division course on either China or Japan from the same discipline/department. Students who choose China as one of their areas must take the second disciplinary course on China; students who choose Japan as one of their areas must take Japanese history.
(3) One upper-division history course on either China or Japan. Students who choose China as one of their areas must take Chinese history; students who choose Japan as one of their areas must take Japanese history.
(4) As part of the Inter-Area/Interdisciplinary requirement, the student will create his/her own emphasis in the form of a theme or topic to be pursued through courses on countries and regions of East Asia, Southeast Asia, and South Asia.

Advanced language study classes can be counted towards the five Inter-Area/Interdisciplinary upper-division course requirement only if they are in keeping with the theme or topic of the student’s concentration. Students completing the honors program can apply H195A and H195B toward the upper division requirements.

For a list of courses that can be applied towards the Multi-Area concentration, refer to the Group in Asian Studies website.

China. China-focused students must take the following (in addition to the prerequisite courses of Asian Studies 10 and a lower-division history course):
(1) Two years of Mandarin Chinese or equivalent.
(2) Disciplinary focus: one upper-division Theory and Methods course and one upper division course on China from the same discipline/department.
(3) One upper-division history course on China.
(4) As part of the Inter-Area/Interdisciplinary requirement, three upper division courses on China, one upper division course on area outside of China, and one upper division course on Asia. Advanced language study classes, such as the Chinese 100 series, can be counted towards the three upper division courses on China. Students completing the honors program can apply H195A and H195B toward the upper division requirements.

For a list of courses that can be applied toward the China focus, refer to the Group in Asian Studies website.

Japan. Japan-focused students must take the following (in addition to the prerequisite courses of Asian Studies 10 and a lower-division history course):
(1) Two years of Japanese or equivalent.
(2) Disciplinary focus: one upper-division Theory and Methods course and one upper division course on Japan from the same discipline/department.
(3) One upper-division history course on Japan.

R prefix=course satisfies R&C requirement
AC suffix=course satisfies American Cultures requirement
‡Recipient of Distinguished Teaching Award
Asian Studies

Asia and the perspectives of multiple disciplines will be brought to bear on the themes. (F) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor required. Group discussion, research and reporting on selected topics. (F,SP) Upper Division Courses

150. Special Topics. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Advanced research in current issues or regions of Asian studies. The course will focus on specific areas or topics with appropriate comparative material included. Topics change each semester. (F,SP)

H195A-H195B. Senior Honors. (3-3) Individual study supervised by two faculty members. Credit and grade to be awarded on completion of sequence. Prerequisites: Open to seniors in the group major in Asian studies whose GPA is 3.5 or higher in all university work and 3.6 or higher in the major. Supervised readings or field research on a significant problem in Asian studies, collection and analysis of research materials, and the preparation of an honors dissertation in close consultation with two members of the faculty. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Directed group study of special topics approved by the chair of the Group in Asian Studies. (F,SP)

199. Independent Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Individual meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by faculty adviser. Directed individual study on topics approved by the chair of the Group in Asian Studies. (F,SP) Staff Graduate Courses

201. Asian Studies Proseminar. (1) Course may be repeated for credit. Fifteen hours of seminar per semester. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. This course is required of all first-year graduate students and supervised by a regular faculty member. The seminar will familiarize students with faculty, their interests, research methods, and the courses they teach. It consists of presentations by faculty on their past, present, and future research. (F,SP) Staff

299. Independent Study. (1-7) Individual conferences to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Directed reading in subject matter not covered in scheduled seminar offerings. (F,SP) Staff

Astronomy (College of Letters and Science)

Department Office: 601 Campbell Hall, (510) 642-5275
Chair: Donald Backer, Ph.D.
University Professor
Frank H. Shu (Emeritus), Ph.D.
Professors
Gibor Basri, Ph.D. University of Colorado, Boulder. Star formation, magnetic activity, brown dwarfs, high resolution spectroscopy
Steven Beckwith, Ph.D. California Institute of Technology. Cosmology, galactic evolution, galactic luminosity function
Lio Blitz, Ph.D. Columbia University. Star formation, galaxy structure, evolution and radio astronomy
Eugene Chiang, Ph.D. California Institute of Technology. Star and planet formation, planetary dynamics, circumstellar and circumplanetary disks (Earth and Planetary Science)
Marc Davis, Ph.D. Princeton University. Physical cosmology, large-scale structure, dark energy (Physics)
Imre de Pater, Ph.D. University of Leiden. Solar system, astro and infrared astrophysics (Earth and Planetary Science)
Alex Filippenko, Ph.D. California Institute of Technology. Supernovae, cosmology, black holes, active galaxies, gamma-ray bursts
Jarji Graham, Ph.D. Imperial College, London. Intergalactic medium, active galaxies, infrared astronomy
Cari E. Heiles, Ph.D. Princeton University. Interstellar medium, magnetic fields
Raymond Kozaczynski, Ph.D. California Institute of Technology. Planetary interiors and origins (Earth and Planetary Science)
Chung-Pei Ma, Ph.D. Massachusetts Institute of Technology. Cosmology, large-scale structure, dark matter
Geoff Marcy, Ph.D. University of California, Santa Cruz. Detection and study of extrasolar planets, planetary science, stellar activity
Christopher McKee, Ph.D. University of California, Berkeley. Interstellar medium, star formation (Physics)
Eliot Quataert, Ph.D. Harvard University. Compact objects, accretion
Uros Seljak, Ph.D. Massachusetts Institute of Technology. Cosmology, large-scale structure (Physics)
Martin White, Ph.D. Yale University. Physical cosmology, large-scale structure (Physics)
Jonathon Arons (Emeritus), Ph.D.
C. Stuart Bowyer (Emeritus), Ph.D.
Leonard V. Kuhn (Emeritus), Ph.D.
Hyron Spinrad (Emeritus), Ph.D.
Harold F. Weaver (Emeritus), Ph.D.
William J. Welch (The Watson and Marilyn Alberts Chair Emeritus), Ph.D.
Associate Professor
Josh Bloom, Ph.D. California Institute of Technology. Gamma ray bursts, transients, instrumentation
Assistant Professors
Geoffrey Bowyer, Ph.D. University of California, Berkeley. Transit radio sources, radio interferometry, extragalactic radio sources
Daniel Kasen, Ph.D. University of California, Berkeley. Theoretical and computational astrophysics
Burkhard Militzer, Ph.D. University of Illinois at Urbana-Champaign. Ab initio simulations of planetary interiors (Earth and Planetary Science)
Adjunct Professors
Albert Glassgold, Ph.D. Massachusetts Institute of Technology. Interstellar medium, star formation, astrochemistry
Paul Kalas, Ph.D. University of Hawaii, Manoa. Circumstellar disks, exoplanets, instrumentation
Richard I. Klein, Ph.D. Brandeis University. Star formation, accreting X-ray sources, radiation-hydrodynamics, interstellar medium
Peter Nugent, Ph.D. University of Oklahoma. Supernovae, cosmology, wide-field optical surveys

Department Overview

The Department of Astronomy offers undergraduate and graduate instruction in a wide variety of fields, including theoretical and observational astrophysics; infrared, optical, and radio astronomy; galactic structure and dynamics of stellar systems; high-energy astrophysics; and cosmology; star and planet formation; and spectroscopy. A considerable amount of research and teaching related to astronomy is done in other units at Berkeley, including the Departments of Astronomy and Earth and Planetary Science, the Space Science Laboratory, and the Lawrence Berkeley National Laboratory. Various professors in the Department of Chemistry, Mathematics, Statistics, and Engi-
The Minor in Astrophysics

The minor program consists of two courses, either 120, 121, or 122; or 160, C161, or C162; plus three upper division electives. All courses must be taken for a letter grade.

Prerequisites. Physics 7A, 7B, 7C (or equivalent); Math 1A, 1B, 53, 54 (or equivalent). These courses must be taken for a letter grade. Students must have a C or better. Students must achieve a minimum GPA of 2.0 in the seven courses. Astrophysics 7A and 7B are recommended for the minor but not required.

For more information regarding this program, contact the undergraduate student affairs officer in 611 Campbell Hall.

Graduate Programs

The graduate program is aimed at the Ph.D. degree in astrophysics. Entering students need not have majored in astronomy, although some background in astronomy is desirable. A strong background in physics, however, is essential.

In addition to the qualifying examination required by the University, the department requires students to pass a preliminary examination that tests their breadth and depth of knowledge of three specialized research areas chosen by the student from a list of about 10. Students choose, with the aid of their adviser, courses in the department that are useful in preparing for the preliminary and qualifying examinations. In addition, students must pass two graduate courses taken outside the department and must acquire one year’s teaching experience. The program normally takes five to six years. Additional information on the program is available upon request from the department.

The requirements for the M.A. degree are 24 units in graduate or upper division undergraduate courses (12 of which are graduate courses) and the preliminary examination.

Lower Division Courses

3. Introduction to Modern Cosmology. (2) Two hours of lecture per week. Description of research and results in modern extragalactic astronomy and cosmology. We read the stories of discoveries of the present-day cosmologists and explore how we understand our place in the Universe. Simple algebra is used. Bloom, Davis, Ma

7A. Introduction to Astrophysics. (4) Students will receive 2 units of credit for 7A after taking 10; 6 units of credit for both 7A-7B after taking 10. Three hours of lecture per week; Three hours of laboratory per week. Prerequisites: Physics 7A-7B (7B can be concurrent), or consent of the instructor. This is the first part of an overview of astrophysics, with an emphasis on the way in which physics is applied to astronomy. This course deals with the solar system and stars, while 7B covers galaxies and cosmology. Solar system topics include orbital mechanics, geology of terrestrial planets, planetary atmospheres, and the formation and evolution of the solar system. The study of stars will treat determination of observations, properties and stellar structure, and evolution. The physics in this course includes mechanics and gravitation; kinetic theory of gases; properties of radiation and radiative energy transport; quantum mechanics of photons, atoms, and molecules; and an introduction to special and general theories of relativity. (SP) Bloom, Chang, Marcy, Quataert

10. Introduction to General Astronomy. (4) Students will receive no credit for 10 after taking 7A or 7B. Students can take a deficient grade in 10 by the instructor’s permission (CS 10). Three hours of lecture and one hour of discussion per week. A description of modern astronomy with emphasis on the structure and evolution of stars, galaxies, and the Universe. Additional topics optionally discussed include quasars, pulsars, black holes, and extraterrestrial communication, etc. Individual instructor’s synopses available from the department. Also listed as Letters and Science C70U. (F) Filippenko

C10. Introduction to General Astronomy. (4) Students will receive no credit for C10 after taking 10, 7A, or 7B. Students can remove a deficient grade in C10 by taking 10. Three hours of lecture and one hour of discussion per week. A description of modern astronomy with emphasis on the structure and evolution of stars, galaxies, and the Universe. Additional topics optionally discussed include quasars, pulsars, black holes, and extraterrestrial communication, etc. Individual instructor’s synopses available from the department. Also listed as Letters and Science C70U. (F) Filippenko

C12. The Planets. (3) Students will receive no credit for C12 after taking N12, W12, Earth and Planetary Sciences 7C (may be taken concurrently). Two hours of lecture per week. A tour of the mysteries and inner workings of our solar system. What are planets made of? Why do they orbit the sun the way they do? How do planets form, and what are they made of? Why do some become massive moons, volcanoes, and ice flows? What makes the Earth hospitable for life? Is the Earth a common type of planet or some cosmic quirk? This course will introduce basic physics, chemistry, and math to the story of the planets, moons, rings, comets, asteroids, atmospheres, and oceans. Understanding other worlds will help us save our own planet and help us understand our place in the Universe. Also listed as Letters and Science C70T and Earth and Planetary Science C12. (F,SP)

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Section 1 to be graded on a pass/not passed basis. One-size fits all seminar exploring one astronomical topic in depth. Students are responsible for much of the presentation. (SP) Basri, Filippenko, Davis

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week. Two hours of seminar per week for five weeks. One and one-half hours of seminar per week for one unit. Two hours of seminar per week for eight weeks. Three hours of seminar per week for five weeks. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: Astronomy 112 (may be taken concurrently). Formerly 110B. Topics will vary with instructor. (F,SP)

98. Directed Group Study. (1-4) Course may be repeated for credit as topic varies. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a pass/not passed basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor. Topics will vary with instructor. (F,SP) Staff

99. Directed Study in Astronomy. (1-3) Course may be repeated for credit. Must be taken on a pass/not passed basis. Supervised observation of the sky or directed reading for lower division students. (F,SP) Staff

Upper Division Courses

100. Communicating Astronomy. (1-2) Course may be repeated for credit. Two hours of lecture per week plus time spent at K-12 schools. This course is for undergraduate or graduate students interested in improving their ability to communicate their scientific knowledge to the public and more specifically to K-12 teachers. The course is an introduction to science education and teaching methodology and pedagogy with six weeks of supervised teaching in local K-12 schools. The students will use materials developed by the Lawrence Hall of Science and will develop a demonstration of their own. They will receive feedback on their presentations. There will be some general discussion of the state and methods of science education. (F,SP) Basri

120. Optical Astronomy Laboratory. (4) Hours of discussion and one hour of lecture per week. Prerequisites: 7A-7B; Mathematics 53, 54; Physics 7A-7B-7C (7C may be taken concurrently). Formerly 120A. This course requires four to six experiments such as the following: accurate position measurements of stars with subsequent derivation of the diameter of the Earth and the refraction of the atmosphere; laboratory exploration of the characteristics of charge-coupled devices; measurement of mountain locations, red- dening, and age of a star cluster; measurement of the Stokes parameters and linear polarization of diffuse synchrotron and reflection nebulae; measurement of the period and pulse shape of the Crab pulse using Fourier techniques. There is a heavy emphasis on error analysis, software development in the IDL language, and high-quality written reports. (F) Graham
C212. Planetary Astrophysics. (4) Three hours of lecture per week. Prerequisites: Mathematics 53, 54; Physics 7A-7B-7C. Formerly C149. Physics of planetary systems, both solar and extra-solar. Star and planet formation, rotation, migration, tidal effects, small-body dynamics and interaction of radiation with matter, tides, planetary interiors, atmospheres, and magnetospheres. High-quality oral presentations may be required in during the problem sets and a final project. Also listed as Earth and Planetary Science C162. Chiang, de Pater, Marcy

200. Radiation Processes in Astronomy. (4) Three hours of lecture per week. Prerequisites: Physics 105, 110A, 110B concurrently; open to advanced undergraduates with GPA of 3.70. Formerly 210A. An introduction to the basic physics of astronomy and astrophysics at the graduate level. Principles of energy transfer by radiation. Elements of classical and quantum theory of photon emission; bremsstrahlung, cyclotron, and synchrotron radiation. Compton scattering, atomic, molecular, and nuclear electromagnetic transitions. Collisional excitation of atoms, molecules, and nuclei. Chiang, Quataert


204. Numerical Techniques in Astronomy. (3) Three hours of seminar per week. Prerequisites: Mathematics 54. Methods of data analysis, model fitting, and data display, all oriented towards the detailed analysis of astronomical observation data and/or numerical results from simulations. Specific topics include probability density functions, error propagation, maximum likelihood, least squares, data and function fitting. Fourier transforms, wavelets, principal components analysis, color images. The software and language used is the Interactive Data Language (IDL). (SP) Heiles

216. Interstellar Matter. (3) Three hours of lecture per week. Prerequisites: 201. A survey of the observational data and theoretical ideas on the interstellar medium, with emphasis on the inferred physical conditions. (F) Blitz, Heiles, Glassgold, Graham

217. Radiative Astrophysics. (3) Three hours of lecture per week. Prerequisites: 201. The use of spectroscopy to diagnose physical conditions in optically thick objects is covered. Both continuum and spectral line formation (including NLTE) are treated. Modern research topics in this core area of astrophysics, like stellar atmospheres, star formation, and accretion disks, are also covered. (SP,Glassgold, Quataert

218. Stellar Dynamics and Galactic Structure. (3) Three hours of lecture per week. A basic course on the kinematics of the galaxy; stellar population concepts; dynamics of stellar systems with and without encounters. (F) Blitz, Davis, Graham

C228. Extragalactic Astronomy and Cosmology. (3) Three hours of lecture per week. A survey of physical cosmology—the study of the origin, evolution, and fate of the Universe. The Friedman-Robertson-Walker model, thermal history and big bang nucleosynthesis, evidence and nature of dark matter and dark energy, the formation and growth of galaxies and large scale structure of the universe, cosmic microwave radiation, inflation in the early universe, tests of cosmological models, and current research areas. The course complements the material of Astronomy 201B. Staff

C249. Solar System Astrophysics. (3) Three hours of lecture per week. The physical foundations of planetary systems. Topics include planetary interiors and surfaces, planetary atmospheres and magnetospheres, and smaller bodies in our solar system. The physical processes at work are developed in some detail, and an evolutionary picture for our solar system, and each class of objects, is developed. Some discussion of other (potentially) planetary systems is also included. Also listed as Earth and Planetary Science C249. (F) Chiang, de Pater

250. Special Topics in Astrophysics. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Topics will vary from semester to semester. See department for announcements. (SP) Staff

252. Stellar Structure and Evolution. (3) Three hours of lecture per week. Prerequisites: Physics 110A-110B, 112, 137A-137B. Formerly C252 and Physics C252. Equations of stellar structure, radiative transfer theory and convection, thermonuclear reactions and stellar energy generation; stellar models, degenerate configurations, evolutionary sequences, supernovae, neutron stars, black holes, nucleosynthesis. (F) Filippenko, Marc

C254. High Energy Astrophysics. (3) Three hours of lecture per week. Prerequisites: 201 or consent of instructor. 202 recommended. Basic physics of high energy radiation processes in an astrophysics environment. Cosmic ray production and propagation. Applications selected from pulsars, X-ray sources, supernovae, interstellar medium, extragalactic radio sources, quasars, and big-bang cosmologies. Also listed as Physics C254. (F) Boggs, Quataert

255. Computational Methods in Theoretical Astrophysics. (3) Three hours of lecture per week. Prerequisites: 201. One or consent of instructor. 202 recommended. Basic physics of high energy radiation processes in an astrophysics environment. Cosmic ray production and propagation. Applications selected from pulsars, X-ray sources, supernovae, interstellar medium, extragalactic radio sources, quasars, and big-bang cosmologies. (SP) Staff

C285. Theoretical Astrophysics Seminar. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. The study of theoretical astrophysics. Requirements are as specified for Physics C285. (F,SP) Arons, Chiang, Quataert

290A. Introduction to Current Research. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Survey of research currently being performed in the department or the university. (F) de Pater

290B. Introduction to Current Research. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Continuation of 290A. Study of a research topic with an individual staff member. (SP) de Pater

C290C. Cosmology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. In addition to the weekly colloquium, the department offers seminars in advanced topics, several of which are announced at the beginning of each semester. A maximum of 5 units may be taken per semester with a limitation of 2 units in one any one section. (F,SP) Staff

298. Directed Group Study. (1-4) Course may be repeated for credit. Tutorial. Must be taken on a satisfactory/unsatisfactory basis. Tutorial for groups of two or three students. (F,SP) Staff

299. Advanced Study and Research. (2-12) Course may be repeated for credit. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). May not be used for unit or residence requirement for the doctoral degree. (F,SP) Staff

Professional Courses

300. Instructional Techniques in General Astronomy. (2-6) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Discussion and practice of teaching techniques as applied to astronomy. Open to graduate students who are presently teaching assistants or associates. Two units for course plus one section; 3 units for two discussion sections. (F,SP) Staff

301. Undergraduate Astronomy Instruction. (1-2) Course may be repeated for a maximum of 4 units. One hour of lecture and three to six hours of laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: An elementary astronomy course and consent of instructor. Open to a limited number of highly qualified undergraduate students interested in astronomy teaching at the college level. Students will participate in a seminar on educational methods and engage in tutorial or laboratory teaching under supervision of a faculty member. Staff
Bioengineering
(College of Engineering)

Department Office: 306 Stanley Hall, (510) 642-5833 bioeng.berkeley.edu
Chair: Matthew Tirrell, Ph.D.

University Professor
Richard M. Karp (The Class of 1939 Professor), Ph.D.
Harvard University. Analysis of algorithms

Professors
Adan Arkin, Ph.D. Massachusetts Institute of Technology. Computational biology, systems biology
Stanley A. Berger, Ph.D. Brown University. Fluid mechanics
Thomas F. Budinger, M.D., Ph.D. University of California, Berkeley. Biomedical imaging
James Casey, Ph.D. University of California, Berkeley. Continuum mechanics
Stanley Corillo, Ph.D. Stanford University. Medical imaging and electrical engineering
Dan A. Fletcher, Ph.D. Stanford University. Optical force and microscopy, cellular mechanics, biomedical devices
Teresa Head-Gordon, Ph.D. Carnegie-Melon University. Theoretical chemistry, computational biology
Kevin E. Hecht, Ph.D. University of Pennsylvania. Biomedical imaging
John Keating, Ph.D. University of Michigan. Synthetic biology
Tony M. Keaveny, Ph.D. Cornell University. Tissue engineering and biomechanics
Luke Lee. Ph.D. University of California, Berkeley. Biomedical imaging, or other stains for microorganisms (BIOEMS), nanotechnology
Dana Liepmann, Ph.D. University of California, San Diego. Fluid dynamics, Bio-MEMS
Sharmin Majumdar (In Residence), Ph.D. Yale University. Magnetic imaging
Jieun Malik, Ph.D. Stanford University. Computer vision
Gerard L. Marnott, Ph.D. University of Illinois. Biomaterials
Sarah J. Nelson, Dr. rer. Nat. University of Heidelberg. Biomedical imaging
Lisa A. Pratt, Ph.D. Brown University. Tissue biomechanics
David Rempel (In Residence), Ph.D. University of California, San Francisco. Tissue biomechanics, internal medicine
David Shackleford, Ph.D. University of California, Berkeley. Robotics, control systems
David Seet, Ph.D. Massachusetts Institute of Technology. Systems biology, stem cell engineering, gene therapy
Matthew Tirrell (Chair), Ph.D. University of Massachusetts. Biomaterials
Boris Rubinsky (Emeritus), Ph.D.

Associate Professors
Ivan Holmes, Ph.D. University of Cambridge. Computational genomics
Song Li, Ph.D. University of California, San Diego. Tissue engineering
Mahmoud Mostafid, Ph.D. University of Toronto. Biomechanics, tissue engineering
Kimmen Sjölander, Ph.D. University of California, Santa Cruz. Computational biology, phylogenomics

Assistant Professors
J. Christopher Anderson, Ph.D. Scripps Research Institute. Synthetic biology
Irina Conboy, Ph.D. Stanford University. Stem cell biology, aging
John Dueber, Ph.D. University of California, San Francisco. Synthetic biology
Amy Herr, Ph.D. Stanford University. BioMEMS, new tools for quantifying biomolecules in complex biological fluids
Sanjay Kumar, Ph.D. Johns Hopkins University School of Medicine. Molecular biophysics, tissue engineering
Stung-Whit Lauren, Ph.D. University of Texas, Austin. Nanotechnology, nanomaterials

Adjunct Professor
Paul Adams, Ph.D. University of Edinburgh. Structural biology

Overview

The field of bioengineering applies engineering principles and practices to living things, integrating biological and medical sciences with advanced technology to help people live longer and healthier lives. No other field fulfills the potential for interdisciplinary research more than bioengineering. We anticipate future breakthroughs, ranging from the design of drugs customized to an individual's genome to tiny implantable drug delivery devices, to software and components that allow researchers to design bacteria like electronic circuits.

Bioengineering at UC Berkeley is supported by exceptional faculty, strong ties to other departments on campus, and close collaborations with institutions like UC San Francisco and Lawrence Berkeley National Lab. Our curriculum provides a solid foundation in engineering and the biological sciences, with the freedom to explore a variety of topics from the most advanced areas of research. This unique environment for learning and research in a rapidly growing discipline provides dedicated students with the education required to become a leader in the field of bioengineering.

See the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study at coe.berkeley.edu/college-of-engineering-announcement for more information.

Undergraduate Program

Bioengineering at UC Berkeley is a multidisciplinary undergraduate major intended for academically strong students who excel in the physical sciences, biological sciences, and engineering. Majors offer students an opportunity to learn how to apply the physical sciences and mathematics in an engineering approach to biological systems. The undergraduate major requires that all students will be well grounded in the fundamental principles and methods of engineering, as well as in integrative and molecular biology. There are further opportunities for specialization in advanced areas of both engineering and biology, including laboratory and clinical components.

The undergraduate bioengineering major offers defined concentrations in biomaterials, biomechanics, biomedical devices, cell and tissue engineering, computational biology, synthetic biology, and pre-med. Bioengineering graduates may enter industry, go on to medical school, and/or pursue graduate studies in bioengineering and related disciplines.

Curriculum and Requirements for the Bachelor’s Degree

Students must complete a minimum of 120 units, in which they must satisfy the University of California and Berkeley campus requirements outlined in this catalog. In addition, students must complete the requirements for the College of Engineering joint major. Full details on these requirements can be found in the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study available online at coe.berkeley.edu/college-of-engineering-announcement. Also see our eight defined concentrations in the Announcement for suggested programs of study.

Joint Major in Bioengineering/Materials Science and Engineering

The Department of Bioengineering offers a joint major with the Department of Materials Science and Engineering for students who have an interest in the fields of bioengineering and materials science. The joint major curriculum includes exposure to fundamental courses in engineering and life sciences and will allow students to understand the interface between the two major fields. Students taking this joint major will successfully compete for jobs in the field of biomaterials in academia, industry, and government.

Bioengineering Minor

The department offers a minor in bioengineering that is open to all students who are not majoring in bioengineering and who have completed the necessary prerequisites for the minor requirements. Information is available in 306 Stanley Hall.

Graduate Program

The Ph.D. and master's degree in bioengineering are jointly offered by UC Berkeley and UC San Francisco (UCSF). Interested students should contact the Department of Bioengineering at UC Berkeley. This program permits students to benefit from both the excellent clinical and health sciences resources available on the San Francisco campus and the outstanding engineering and basic life sciences resources available on the Berkeley campus.

With over 140 faculty members from many departments on the two campuses, our program offers an integrated graduate education in bioengineering. Students in the program may take courses and perform research on either or both campuses.

All students in the program are simultaneously enrolled in the graduate divisions of both the San Francisco and Berkeley campuses and are free to take advantage of courses and research opportunities on both campuses. The program awards the Doctor of Philosophy in Bioengineering degree from both campuses.

Students with a B.A. or B.S. degree in engineering, biology, or other sciences are eligible for admission. Students can obtain additional information and application materials by contacting the Bioengineering Graduate Program, 306 Stanley Hall, University of California, Berkeley, Berkeley, CA 94720-1762; (510) 642-9931; bioegrad.berkeley.edu.

Lower Division Courses

10. Introduction to Biomedicine for Engineers. (4)
Three hours of lecture and one hour of discussion per week. This course is intended for lower division students interested in biomaterials in biomedicine with topics ranging from evolution biology to human physiology. The emphasis is on the integration of engineering applications to biology and health. The graduate engineering students must gain sufficient biology and human physiology fundamentals, so that they are better prepared to study specialized topics, e.g., biomechanics, imaging, cell and tissue engineering, bio-monitoring, drug development, robotics, and other topics covered by upper division and graduate courses in UC Berkeley Departments of Molecular and Cell Biology, Integrative Biology, Bioengineering, Electrical Engineering and Computer Science, Mechanical Engineering, and courses in the UC San Francisco Division of Bioengineering. The specific lecture topics and supporting laboratory material will include general biochemistry and proteomics as well as topics on plant and animal evolution, stem cell biology, and protein and proteomics.

11. Computational Biology. (4)
Three hours of lecture per week. Prerequisites: 22L (must be taken concurrently). This course is intended to introduce students to a variety of fields that fall under the bioinformatics umbrella. In general, these fields include medical, microbial, agricultural, animal, and forensic biotechnology. Students in this course will learn the types of biotechnologies and tools currently being worked on, as well as the techniques and common uses of these projects.

L. Lee, Dueck

22L. Biotechnology Laboratory. (2) Six hours of laboratory per week. Prerequisites: 22L (must be taken concurrently). This course is intended to introduce students to the variety of fields that are used in current day biotechnology projects. During this course, students will get hands-on molecular and cellular biotechnology experience working with E. coli, yeast, mammalian, and microbial DNA, RNA, and proteins. This is a bioengineering course; the focus of these exercises will be on the critical understanding of biochemical, biophysical, or physical mechanisms, and the application of different experimental methods, techniques, and instrumentation used. Students leaving

prefix=language course for business majors
prefix=honors course
prefix=course satisfies R&c requirement
prefix=suffix/course satisfies American Cultures requirement
prefix=online course
*Professor of the Honors College
†Recipient of Distinguished Teaching Award
92. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Group study meet- ings. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Organized group study on various topics under the sponsorship of a member of the bioengineering faculty. (F,SP) Liepman, Staff

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrolment is restricted; see the Introduction to Courses and Curricular section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Freshman or sophomore standing and consent of instructor. Supervised independent study for lower division stu- dents. (F,SP) Staff

Upper Division Courses

100. Ethics in Science and Engineering. (3) Three hours of lecture per week. The goal of this semester course is to present the issues of professional con- duct in the practice of engineering, research, publi- cation, patents, and in professional and financial conflicts. The method is through historical didactic presentations, case studies, presentations of methods for problem solving in ethical matters, and classroom debates on contem- porary ethical issues. The faculty will be drawn from national experts and faculty from religious studies, journalism, and law from the Berkeley campus. (SP) Heald-Gordon

101. Instrumentation in Biology and Medicine. (4) Three hours of lecture and three hours of discussion/ computer laboratory per week. Prerequisites: Electrical Engineering 100, Mathematics 53, 54, Physics 7A-7B, or consent of instructor. This course teaches the fundamentals of measuring modern instrumentation used in biology and medicine. Organized around three classes of instruments—bioelectronics, optical microscopy, and medical imaging—the course takes an integrative approach to measurement theory and practice by preparing and analyzing example instruments currently used for biological and medical research. For each instrument, students will learn the fundamentals of operation, methods of control, mecha- nisms of fundamental errors, principles of detection, and methods for signal processing and error estimation. Current biological questions and medical problems investigated with each type of instrument will be discussed. (SP) Conolly

102. Biomechanics. (4) Three hours of lecture and three hours of computer laboratory per week. Pre- requisites: Math 53, 54; Physics 7A. This course intro- duces students, develops, and relates the methods of continuum mechanics to tissue-level biomechanical phenomena. It is intended for upper- level undergraduate students who have been exposed to vectorial and tensorial analysis, and to undergraduate courses in either fluids or transport, and molecular biology. Topics include biostatic and biotrauma mechanics; elastic (time-independent), vis- coleastic, and poroelastic (time-dependent) behaviors of tissues; continuum and microstructural models; constitutive laws; material properties of tissues; exper- imental methods—macroscopic rheology. (F) Mofrad

104. Biological Transport Phenomena. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Math 54, Physics 7A. The transport of mass, momentum, and energy are critical to the function of living systems and the design of medical devices. Biological transport phe- nomena are present at a wide range of length scales: molecular, cellular, organ (whole and by functional unit), and organism. This course develops and applies scaling laws and the methods of continuum mechan- ics to biological transport phenomena over a range of length and time scales. The course is intended for undergraduate students who have taken a course in differential equations and an introductory course in physics. Students should be familiar with basic biology; an understanding of physiology is helpful but not assumed. (SP) Johnson

110. Biomedical Physiology for Engineers. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 10; Biology 1A; Math 54 (may be taken concurrently). This course introduces stu- dents to the physiology of human organ systems, with an emphasis on quantitative problem solving, engi- neering-modeling style, and applications to clinical medicine. It is intended for students with a review of basic principles of cellular physiology, including membrane transport and electrophysiology, and then take a system-by-system approach to the physiology of var- ious organ systems, including the cardiovascular, pul- monary, renal, and endocrine systems. Throughout, the course will feature extensive discussions of clinical conditions associated with dysfunction in specific phys- ical processes as well as the role of medical devices and prostheses. This course is geared toward upper-division bioengineering students who wish to solidify their foundation in physiology, especially in preparation for a career in medicine or the biomedical device industry. (SP) Kumar

111. Functional Biomaterials Development and Characterization. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A or 4A; Biology 1A and 1AL; and Cell Biology 1C and 1CL; or consent of instructor. This laboratory course is intended for upper-level engineering undergraduate students interested in the development of novel functional proteins and peptide motifs and characterization of their physical and bio- logical properties using various instrumentation tools in quantitative manners. (SP) Healy

112. Molecular Cell Biomechanics. (3) Three hours of lecture and one hour of discussion per week. Pre- requisites: Mathematics 54, Physics 7A, 102; or consent of instructor. This course develops and applies scaling laws and the methods of continuum and sta- tistical mechanics to biomechanical phenomena over a range of length scales, from molecular to cellular levels. It is intended for undergraduate stu- dents who have been exposed to differential equa- tions, mechanics, and certain aspects of modern biology. (SP) Mofrad

113. Stem Cells and Technologies. (3) Three hours of lecture and one hour of discussion per week. Pre- requisites: Corequisites: Consent of instructor. This course will teach the main concepts and current views on key attributes of embryonic stem cells (ESC); introduce theory of their function in embryonic develop- ment; methods of ESC derivation, propagation, and characterization; and discuss currently developing stem cell technologies. (SP) Conolly

115. Cell Biology for Engineers. (4) Two hours of lecture and six hours of laboratory per week. Pre- requisites: Chemistry C130/Molecular Cell Biology C100A or equivalent recommended. Differences in the biological characteristics of tissues are altered by cells in response to culture conditions, loading, injury, and other various factors. A contemporary understanding of the function, and long-term and short-term knowledge of tissue microstructure, composition of matrix, and cell function. Students will be introduced to molecular biology techniques as applied to cells and tissues including immunofluorescence, image analysis, protein quantification, gene expression, and cell cul- ture. (F,SP) Johnson

116. Cell and Tissue Engineering. (4) Three hours of lecture and one hour of discussion per week. Pre- requisites: 102 and Chemistry C130/Molecular and Cell Biology C100B or equivalent recommended, or con- sent of instructor. The goal of tissue engineering is to fabricate substitutes to restore tissue structure and functions. Understanding cell function in response to environmental cues will help us to establish design criteria and develop engineering tools for tissue fabrication. This course will introduce the basic con- cepts and advances in the field, and train students into engineers in bioengineering. The course nec- essary for GMP facility; project manage- ment; and engineered solutions to environmental challenges. This course is of interest to students in all areas of biology, including medical engineering and manufacturing, chemical engi- neering, and bioengineering. (SP) Liepmann, Staff

C117. Structural Aspects of Biomaterials. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102, Biology 1A, Engineering 45, and Civil and Environmental Engineering 130 or 130N. This course covers the structure and mechanical func- tions of load-bearing tissues and their replacements. Natural and synthetic load-bearing biomaterials for clinical applications are reviewed. Biocompatibility of biomaterials and host response to structural implants are examined. Quantitative treatment of biomechani- cal issues and constitutive relationships of tissues are covered in order to design biomaterial replacements for structural function. Material selection for load bear- ing applications including replacement of skin, bone, tendons, cartilage, tendons, bone, joint, bone and cartilage, ligaments, and ligaments and tendons are discussed. Mechanical design for longevity including topics of fatigue, wear, and fracture are reviewed. Case studies that address the design of devices are presented. This course includes a teaching/design laboratory compo- nent that involves design analysis of medical devices and outreach teaching to the public community. Sev- eral problem-based projects are utilized throughout the semester for design analysis. In addition to tech- nical content, this course involves rigorous technical writing assignments, oral communication skill develop- ment, and teamwork. Also listed as Mechanical Engineering C117. (SP) Pruitt

C118. Biological Performance of Materials. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C105B/Mechanical Engineering C105B or equivalent; 102 and 104; Engineering 45; and Molecular and Cell Biology 130 recommended. This course is intended to give students the opportu- nity to expand their knowledge of topics related to biomedical materials selection and design. Structure- property relationships of biomedical materials and their interaction with biological systems will be addressed. Applications of the concepts developed include blood-materials compatibility, biometric mat- erials, drug delivery, tissue engineering, and biomechanics. Also listed as Materials Science and Engineering C118. (F) Healy
112. Introduction to Micro- and Nanobiotechnology: BioMEMS. (3) Three hours of lecture per week. Prerequisites: Chemistry 3B and Physics 7B or consent of instructor. Biophysical and chemical principles of biomedical microelectromechanical systems (bioMEMS) for the measurement of biological phenomena and clinical applications. Micro- and nanoscale devices and interdisciplinary topics including surface micromachining and biomolecules. Topics include solid-state transducers, optical transducers, electrochemical transducers, biomical microelectronics, microfluidics, and hybrid integration of microfabrication technology. (F) L. Lee, Keaveny

C125. Introduction to Robotics. (4) Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: Electrical Engineering 120 or equivalent; consent of instructor. This course introduces students to the fundamental design and fabrication of control systems, sensors, actuators, and robot control. (F, S) D. E. Quebeck

113. Introduction to Computational Molecular and Cell Biology. (4) Students will receive no credit for 131 after taking 231. Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 53 and Biology 1A (may be taken concurrently). Topics include computational approaches and techniques to model gene expression and genome annotation, sequence analysis and dynamic programming, protein domain analysis, RNA folding and structure prediction, RNA sequence design for synthetic biology, and biological pathways and networks. Students are introduced to biological concepts and the use of biological and programming software. Course requirements include a final project, laboratory report, and a term paper. (F, S) P. P. Bickel, A. B. Novak

C119. Orthopedic Biomechanics. (4) Three hours of lecture and one hour of discussion/computer workshop per week. Prerequisites: Mechanical Engineering 120 or 180, or Biomedical Engineering 120 or 180 (may be taken concurrently). Proficiency in MATLAB or equivalent. Formerly C176.Statics, dynamics, optimization theory, composite beam theory, beam-on-elastic foundation, Hertz contact mechanics, and materials behavior. Forces and moments acting on human joints; composition and mechanical behavior of orthopedic biomaterials; design and analysis of artificial joints; bone and tissue prostheses; musculoskeletal tissues including bone, cartilage, tendon, ligament, and muscle; osteoporosis and fracture-risk prediction of bones; and bone adaptation. MATLAB-based projects to integrate the course material. Also listed as Mechanical Engineering 176. (F, S) P. P. Keaveny

C126. Kinematics and Microfluidics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 53 and ME 120. Students will become familiar with the basic principles of kinematics and microfluidics. Concepts include planar motion, rigid body motion, revolute and prismatic joints, and motion design. Applications to robotics, design of microfluidic systems for biological and chemical analysis, and fabrication of microfluidic systems using soft lithography and microfabrication processes will be covered. (F) P. P. Bickel, A. B. Novak

C130. Chemical Engineering/Biotechnology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 53 and ME 120. Students will become familiar with chemical engineering principles, including transport, reaction kinetics, separations, and process synthesis. Applications of these principles to the design and operation of chemical processes, including biochemical processes, will be covered. (F) J. E. E. Anderson

C135. Frontiers in Microbial Systems Biology. (4) Students will receive no credit for 135 after taking 235. Three hours of lecture and one hour of discussion per week. Prerequisites: Math 53 or equivalent. This course will focus on the mathematical and computational challenges in understanding microbial systems biology, with an emphasis on the integration of genomic, proteomic, and metabolomic data. The course will cover a broad range of topics, including high-throughput sequencing, metabolomics, and systems biology approaches to understanding microbial communities. (S) A. J. D. Joung, J. E. E. Anderson

C137. Introduction to Microbiology. (4) Three hours of lecture per week. Prerequisites: Math 53 or equivalent. This course will provide a biologically oriented introduction to the field of microbiology, including the roles of microorganisms in natural and industrial ecosystems, human health, and disease. The course will cover a broad range of topics, including microbial diversity, physiology, metabolism, genetics, and evolution. (F) A. T. T. Anderson

140L. Synthetic Biology Laboratory. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Mathematics 53 and 54, Chemistry 3A, and Chemistry C130/Molecular and Cell Biology C100A. This level is a comprehensive survey of genetic devices. These DNA-based constructs are comprised of multiple “parts” that together encode a higher-level biological behavior and perform human-defined functions. Such constructs are the engineering target for most projects in synthetic biology. Included within this class of constructs are genetic circuits, sensors, biosynthetic pathways, and microbiontual functions. (F) L. Lee

145L. Introductory Electronic Transducers Laboratory. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Electrical Engineering 40. Laboratory exercises exploring a variety of electronic transducers for measuring physical quantities such as temperature, force, displacement, sound, light, ionetric potential; the use of circuits for low-level differential amplification and analog signal processing using basic techniques of analog and digital sampling and display. Lectures cover principles explored in the laboratory exercises; construction, response and signal to noise of electronic transducers and actuators; and design of circuits for sensing and controlling physical quantities. Also listed as Electrical Engineering C145L. (F) R. Dermo
oped self-assembled nanostructures inspired by nature. The course covers the structures and properties of amino acids, DNAs, sugars, lipids, and their natural and artificial structures. It also covers nanoscale inorganic materials used to develop nanomedicines, bio-imaging, bio-sensors, and electronics, and machinery. (F) S. W. Lee

151. Micro/Nanofluids for Bioengineering and Lab-on-a-Chip. (4) Students will receive no credit for 151 and the hours of lecture and discussion per week will be limited to one hour of discussion per week. Prerequisites: Chemistry 3B, Physics 7B, Bioengineering 102, or Mechanical Engineering 106, or consent of instructor. This course is an introduction to the design, fabrication, and characterization of microfabricated devices and systems, with an emphasis on miniaturization and the integration of micro/nano technologies. Lecture and discussion periods will include readings, discussions, and analyses of relevant research papers. Prerequisites: Consent of instructor. This course covers current topics in research and teaching activities in the field with an emphasis on the development and characterization of micro/nanofluids and their applications. Students will be exposed to cutting-edge research in the field and will have the opportunity to present their work at a national or international conference. (SP) Staff

163. Principles of Molecular and Cellular Biophotonics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7A-7B or 8A-8B or equivalent introductory physics course. This course teaches fundamental principles of optics and examines contemporary methods of optical microscopy for cells and tissues. Students will learn how to design simple optical systems, set up system performance, and apply imaging techniques including transmission, reflection, phase, and fluorescence microscopy to investigate biological samples. The capabilities of optical microscopy will be compared with complementary techniques including electron microscopy, coherence tomography, and atomic force microscopy. Students will also be responsible for researching their final project outside of class and presenting a specific application of their research to biological research such as an end-of-semester project. (F) Herr

164. Optics and Microscopy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7A-7B or 8A-8B or equivalent introductory physics course. This course teaches fundamental principles of optics and examines contemporary methods of optical microscopy for cells and tissues. Students will learn how to design simple optical systems, set up system performance, and apply imaging techniques including transmission, reflection, phase, and fluorescence microscopy to investigate biological samples. The capabilities of optical microscopy will be compared with complementary techniques including electron microscopy, coherence tomography, and atomic force microscopy. Students will also be responsible for researching their final project outside of class and presenting a specific application of their research to biological research such as an end-of-semester project. (F) Herr

190. Advanced Topics in Biomedical Engineering. Course may be repeated for credit. One to four hours of lecture and discussion per week. Students will be encouraged to present their own research on a specific topic of interest. Students will be required to present a poster at the end of the course. Sections 4-6 to be graded on a pass/not passed basis. Prerequisites: Consent of instructor. These courses cover current topics in research and teaching activities with an emphasis on the development and characterization of micro/nanofluids and their applications. Students will be exposed to cutting-edge research in the field and will have the opportunity to present their work at a national or international conference. (SP) Staff

190A. Advanced Topics in Biomechanics and Tissue Engineering. (1-4) (F,SP) Staff

190D. Advanced Topics in Computational Bioengineering. (1-4) (F,SP) Staff

190F. Advanced Topics in Biomedical Imaging and Signal Processing. (1-4) (F,SP) Staff

192. Senior Design Projects. (4) Two hours of lecture and two hours of discussion per week. Prerequisites: Senior standing and consent of instructor. This senior-term course introduces students to bioengineering project-based learning in small teams, with a strong emphasis on real-world solutions for real medical and research problems through project selection, design, implementation, and testing. The course is designed to provide a “capstone” design experience for bioengineering seniors. The course is structured around didactic lectures, and a textbook, from which assigned readings will be drawn, and supplemented with professional readings, and lecture material. Where appropriate, the syllabus includes guest lectures from clinicians and practicing engineers from academia and industry. The course includes active learning through organized activities, during which teams will participate in exercises meant to reinforce lecture material through direct application to the team design project. (F) Herr

194. Honors Undergraduate Research. (3,4) Course may be repeated for credit up to a maximum of 8 units. Variable format. Prerequisites: Upper division technical GPA 3.3 or higher and consent of instructor and adviser. Supervised research. Students who have completed three or more division courses may pursue original research under the direction of one of the members of the staff. May be taken a second time for credit only. A final report or presentation is required. A maximum of 4 units of this course may be used to fulfill the research or technical elective requirement or in the bioengineering program. (F,SP) Staff

196. Undergraduate Design Research. (4) Course may be repeated for credit once. Individual research. Prerequisites: Junior or senior status, consent of instructor, and facilities capable of research. This course will satisfy the Senior Bioengineering Design project requirement. Students with junior or senior status may pursue research under the direction of one of the members of the staff. May be taken a second time for credit only. A final report or presentation is required. (F,SP) Staff

197. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a pass/not passed basis. Prerequisite: Advanced standing and third-year technical GPA 2.0 GPA and above. Group study of a selected topic or topics in bioengineering, usually relating to new developments. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Must be taken on a pass/not passed basis. Independent study. (F,SP) Staff

200. The Graduate Group Introductory Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Enrollment in Ph.D. or M.S. program in bioengineering. An introduction to research in bioengineering including specific case studies and organization of this rapidly expanding and diverse field. (F) Staff

210. Cell Mechanics and the Cytoskeleton. (3) Three hours of lecture per week. Prerequisites: Undergraduate physics and cell biology or consent of instructor. This course explores experimental and computer-simulated descriptions of the cell based on molecular details of the cytoskeleton and its interactions with the cellular microenvironment. Through lectures, discussions, and projects, students will learn about current questions facing the field of cell mechanics and its connections with health and disease. Fundamental biology of the cytoskeleton and associated signaling pathways will be discussed in the context of cell motility, shape change, and mechanotransduction. Modern techniques for quantifying mechanical properties of the cell and its structural components, including low-Reynolds-number flow, atomic force microscopy, and traction-force microscopy will be presented, and recent models of cell mechanics and their predictions will be discussed and debated. (SP) Fletcher

211. Cell and Tissue Mechanotransduction. (3) Three hours of lecture per week. Prerequisites: Undergraduate cell biology or consent of instructor. This course will focus on biological and bioengineering aspects of mechanotransduction, the process through which cell and tissue movement is related to cell and tissue mechanical environment. Students will learn how mechanical inputs to cells influence both subcellular biochemistry and whole-cell behavior. They will also study newly emerging technologies for the measurement and imaging of biofluids and measurement in living cells, and strategies to control the mechanics and chemistry of the extracellular matrix. Finally, students will learn about the role of mechanotransduction in the response of tissues and systems and how these mechanisms may go awry in the setting of the disease. Instruction will feature lectures, discussions, analysis of relevant research papers, assembly of a literature review and a research proposal, and an oral presentation. (F) Kumar

C212. Heat and Mass Transport in Biomedical Engineering. (3) Three hours of lecture per week. Prerequisites: Mechanical Engineering 106, 109. Fundamental processes of heat and mass transport in biological systems; organic molecules, cells, biological organs, whole animals. Derivation of mathematical models and discussion of experimental procedures. Applications to biomedical engineering. Also listed as Mechanical Engineering C212. (SP) Staff

C213. Fluid Mechanics of Biological Systems. (3) Three hours of lecture per week. Prerequisites: Mechanical Engineering 106 or equivalent, or consent of instructor. Fluid mechanical aspects of various biological systems, pulmonary, gastrointestinal, and renal systems. Motion in large and small blood vessels. Pulsatile and peristaltic flows. Other biofluid-mechanical flows: the ear, eye, etc. Instrumentation for fluid measurements in biological systems and for medical diagnosis and applications. Artificial devices for replacement of organs and/or functions, e.g., blood oxygenators, kidney dialysis machines, artificial hearts/circulatory assist devices. Also listed as Mechanical Engineering C213. (F,SP) Berger, Liepmann

C214. Advanced Tissue Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: C176, 185, graduate standing or consent of instructor. Knowledge of MATLAB or equivalent. The goal of this course is to provide a foundation for characterizing and understanding the mechanical behavior of load-bearing tissues. A variety of mechanics topics will be introduced, including anisotropic elasticity, tissue failure, cellular mechanobiology, and quasi-linear viscoelasticity (QLV) theory. Building from this theoretical basis, we will explore the constitutive behavior of a wide variety of biological tissues. After taking this course, students should have sufficient background to independently study the mechanical behavior of most biological tissues. Formal discussion section will include a seminar series with outside speakers. Also listed as Mechanical Engineering C214. (SP) Staff
215. Models of Cell Mechanics: Dynamics of the Cytoskeleton and Nucleus. (3) Three hours of lecture per week. Prerequisites: Open to bioengineering graduate students or consent of instructor. The study of cell mechanics has recently undergone rapid development with particular attention to the dynamics of the cytoskeleton as well as its interactions with the extracellular matrix. This interaction may cause changes in cell architecture, consequently leading to functional adaptation or pathological conditions. A wide range of models exist for cytoskeletal mechanics, ranging from continuum models for cell deformation to actin filament-based models for cell mobility. Numerous experimental techniques have also been established to quantify the cytoskeletal mechanics via perturbing the cell to examine some sort of deformation and ensuing the static and dynamic response of the cell. These experimental observations along with theoretical approaches to the cell have given rise to several theories for describing the mechanics of living cells, modeling the cytoskeleton as a simple mechanical elastic, viscoelastic, or poroelastic continuum, porous gel or soft glassy material, tensegrity network incorporating discrete structural elements that bear compression. (F) Mofrad

216. Macromolecular Science in Biotechnology and Medicine. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Bioengineering 115 or equivalent; open to seniors with consent of instructor. An overview of the problems associated with the selection and function of polymers used in biotechnology and medicine. Principles of polymer science, polymer synthesis, and structure-property-performance relationships of polymers. Particular emphasis will be placed on the performance of polymers in biological environments. Interactions between macromolecular and biological systems for therapy and diagnosis. Specific applications will include drug delivery, gene therapy, tissue engineering, and surface engineering. Also listed as Materials Science and Engineering C216. (SP) Healy

217. Biometric Engineering—Engineering from Biology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or consent of instructor. Study of nature's solutions to specific problems with the aim of determining appropriate engineering analogs. Morphology, scaling, and design in organismic engineering. Structure and function of synthetic systems. Mechanical principles in nature and their application to engineering devices. Mechanical behavior of biological materials as governed by underlying microstructure, will include hierarchical organization both at the tissue and material levels. Trade-offs between redundancy and efficiency. Students will work in teams on projects where they will take examples of designs, concepts, and models from biology and determine equivalent or general-purpose specific engineering solutions. Also listed as Integrative Biology C217 and Mechanical Engineering C217. (F) Dharan

218. Stem Cells and Directed Organogenesis. (3) Three hours of lecture/laboratory per week. Grading: letter; satisfactory/unsatisfactory for CIRM humanities and law fellows. Prerequisites: Consent of instructor. This course will provide an overview of basic and applied embryonic stem cell (ESC) biology. Topics will include early embryonic development, ESC laboratory methods, biomaterials for directed differentiation and other stem cell manipulations, and clinical uses of stem cells. Also listed as Molecular and Cell Biology C237. (SP) Conboy

219. Protein Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. An in-depth study of the current methods used to design and engineer proteins. Emphasis on how strategies can be applied in the laboratory. Current studies will present the various strategies and illustrate method variations and applications. Intended for graduate students. Also listed as Chemical Engineering C217. (F) Tuilman-Èrcek

221. Introduction to Micro- and Nanobiotechnology: BioMEMS. (3) Three hours of lecture per week. Prerequisites: Chemistry 3B and Physics 7B or equivalent; consent of instructor. Biophysical and chemical principles of biomedical microelectromechanical systems (bioMEMS) for the measurement of biological phenomena and clinical applications. Micro- and nanoscale devices include cantilevers, microrobots, and biomolecules. Topics include solid-state transducers, optical transducers, electrochemical transducers, biomolecular microelectronics, microfluidics, and hybrid integration of microfabrication technology. (F) L. Lee 221L. BioMEMS and BioNanotechnology Laboratory. Three hours of laboratory per week. Prerequisites: 102 or 104; 222/22L or Molecular and Cell Biology C100A/Chemistry C130 or equivalent. Students will become familiar with bioMEMS and Lab-on-a-Chip technology. They will fabricate their own novel micro- or nano-scale device to address a specific problem in biotechnology using the latest micro- and nano-technological tools and fabrication processes. Some emphasis on the latest development in polymer microfluidics. In-class literature review, experimental design, and quantitative data analysis. Results will be presented during class presentations and at a final poster symposium. (F,SP) Dwork, L. Lee

222. Polymer Engineering. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil and Environmental Engineering 130 or 130N, Engineering 45. A survey of the structure and mechanical properties of advanced engineering polymers. Topics include viscoelasticity, mechanical properties, yielding, deformation, and fracture mechanisms of various classes of polymers. The course will discuss degradation schemes of polymers and long-time response. The class will include polymer applications in bioengineering and medicine. Also listed as Mechanical Engineering C223. (F) Staff

231. Introduction to Computational Molecular and Cellular Biology. (4) Students will receive no credit for 231 after taking 131. Three hours of lecture and one hour of discussion per week. Topics include computational approaches and techniques to gene structure and genome annotation, sequence alignment using dynamic programming algorithms, RNA folding and structure prediction, RNA sequence design for synthetic biology, genetic and biochemical pathways and networks, UNIX and scripting languages, basic probability and information theory. Various "case studies" in these areas are reviewed and web-based computational biology tools will be used by students and programming projects will be given. (F) Holmes

232. Genetic Devices. (4) Students will receive no credit for 232 after taking 132. Three hours of lecture and one hour of discussion per week. Prerequisites: Engineering 7 or Computer Science 61A, Mathematics 54, Chemistry 3A, and Chemistry 130/Molecular and Cell Biology 130. A comprehensive survey course of genetic devices. These DNA-based constructs are comprised of multiple "parts" that together encode a higher-level biological behavior and perform useful human-defined functions. Such constructs are the engineering target for most projects in synthetic biology. Included within this class of constructs are genetic circuits, sensors, bio- synthetic pathways, and microorganisms. (F) Anderson

235. Frontiers in Microbial Systems Biology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Designed for graduates with background in differential equations and probability. Coursework in molecular cell biology or biochemistry helpful. This course is aimed at graduate and advanced undergraduate students from the (bio)engineering and chemo-physical sciences interested in a research program in systems biology. For students to get the most out of this class, they should take a course in math, such as linear algebra, before or concurrently. (F) Holmes

242. Genetic Devices. (4) Students will receive no credit for 242 after taking 132. Three hours of lecture and one hour of discussion per week. Prerequisites: Open to bioengineering grad- and 54 or equivalent; Molecular and Cell Biology C100A/C102 or equivalent; programming class or consent of instructor. This course reviews the statistical mechanics foundations of the scientific approach to the reconstitution of the genetic information in the cell. Such methods, first proposed in the 1960s by Linus Pauling (and others), are now in reach of practical experimentation due to the falling cost of DNA synthesis technology. Applications of these methods are granted insight into the origin of life and of the human species, and may be powerful tools of synthetic biology. Lectures will review the theoretical concepts and provide students with the tools to develop their own projects. (F) Arkin, Bishof-Pfeifer, Wolf

243. Computational Methods in Biology. (4) Students will receive no credit for 243 after taking 143. Three hours of lecture per week. Prerequisites: Mathematics 53 and 54. Must be able to program in scientific computing language (C, C++, Fortran), MATLAB, or Java. An introduction to computational methods and algorithms, including molecular dynamics, Monte Carlo, mathematical optimization, and "bioinformatic" computational tools and their applications in biological networks. Various case studies in applying these areas in the areas of protein folding, protein structure prediction, drug docking, and enzymes will be covered. Core Specialization: Core B (Informatics and Genomics); Core D (Computational Biology); Bioengineering Content: Biological. (F) Head-Gordon

244. Introduction to Protein Informatics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C100A or 102 or similar background in molecular biology. This course will introduce students to the fundamentals of molecular biology, and to the bioinformatics tools and databases used for the prediction of protein function and structure. It is designed with both the theoretical and popular computational methods, as well as some experience with protein sequence analysis methods applied to real data. This class includes no programming, and the final exams will be take-home. Also listed as Plant and Microbial Biology C244. (F) Spulander

244L. Protein Informatics Laboratory. (2) Six hours of laboratory per week. Prerequisites: C244 (can be taken concurrently, not required) or consent of instructor. This course is intended to introduce students to a variety of bioinformatics techniques that are used to predict protein function and structure. It is designed to be taken concurrently with C244 (which provides the theoretical foundations for the methods used in the laboratory class), although laboratory students are able to take this laboratory course separately. No programming is performed in this class, and no prior programming experience is required. Also listed as Plant and Microbial Biology C244.
including diffusion phenomena, and emphasis on electrokinetic systems and biochemical applications of said phenomena. (SP) Herr

C255. Principles of Magnetic Resonance Imaging. (3) Students will receive no credit for C255 after taking 256. Three hours of lecture per week. Prerequisites: Electrical Engineering C120 or Bioengineering C165/Electrical Engineering C145B. Fundamentals of MRI including signal-to-noise ratio, resolution, and contrast agents, pulse sequences, image acquisition, and instrumentation. Image reconstruction via 2D FFT methods. Fast imaging reconstruction via convolution-back projection and gridding methods and FFTs. Hardware and pulse sequence design. MRI scanners including main field, gradient fields, RF coils, and shim supplies. Software for MRI including imaging methods such as 2D FT, RARE, SSFP, spiral, and echo planar imaging methods. Physics of signal decay and noise characteristics of tissue and artifacts due to dielectric properties of tissues and imaging methods. Orthogonal imaging techniques. (3) F, SP

C279. Occupational Biomechanics. (4) Three hours of lecture/work per week. Overview of ergonomics and occupational biomechanics. Course covers pathophysiology and risk factors of upper extremity and back loading at work, measurement of force and posture, models for risk assessment, anthropometry applied to the design of equipment, and the design and structure of materials for ergonomic programs. Students will conduct a detailed job analysis and design a workplace intervention. (4) F, SP

C280. Introduction to Nanoscience and Engineering. (3) Three hours of lecture per week. Prerequisites: Major in physical science such as chemistry, physics, etc., or engineering; consent of adviser or instructor. A three-module introduction to the fundamentals of Nanoscience and Engineering (NSE) theory and research within chemistry, physics, biology, and engineering. This course covers quantum and solid-state physics; chemical synthesis, growth fabrication, and change in nanostructure, structures and properties of semiconductors, polymer, and biomedical materials on nanoscales; and devices based on nanomaterials. Students must take this course to satisfy the NSE Designated Emphasis Core requirement. Also listed as Materials Science and Engineering C261, Nanoscience and Engineering C201, and Physics C201. (F, SP) Gronsky, S.W.; Lee, Wu

290. Advanced Topics in Bioengineering. (1–3) Course may be repeated for credit. One hour of lecture per week per unit. One to three hours of lecture per week. Prerequisites: Consent of instructor. This course covers current topics of research interest in bioengineering. The course content may vary from semester to semester. (F, SP)

290A. Advanced Topics in Biomechanics and Tissue Engineering. (1–3) (F, SP)

290B. Advanced Topics in Bioinformatics and Genomics. (1–3) (F, SP)

C290C. Topics in Fluid Mechanics. (1,2) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Lectures on special topics which will be announced at the beginning of each semester that the course is offered. Topics may include transport and mixing, geophysical fluid dynamics,roudynematics, oceanography, free surface flows, non Newtonian fluid mechanics, among other possibilities. Also listed as Environ Sci, Policy, and Management C291, Physics C290L, Mathematics C290C, Mathematics C295M, and Environmental Engineering C290K, and Mechanical Engineering C298A. (F, SP) Staff

290D. Advanced Topics in Computational Biomech-
Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Computational biology, chemistry and biophysics of molecular and cellular systems.

Ehud Isacoff, Ph.D. McGill University. Structural dynamics, optical methods, computational methods and visual test design, nonlinear analysis of visual processes.

Stanley A. Klein, Ph.D. Brandeis University. Optometry, spatial vision, psychophysical methods and vision test design, nonlinear analysis of visual processes.

David E. Wemmer, Ph.D. University of California, Berkeley. Optical sensing and control of the activity of neurons, synaptic, and neural circuits.

Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

Eva Nogales, Ph.D. University of California, Berkeley. Molecular mechanisms underlying function of cytoskeleton in cell division and of molecular machines in nucleic acid translocations.

Abby Dernburg, Ph.D. University of California, San Francisco. Biophysical BASIS.

Jamie H. D. Cate, Ph.D. Yale University. Molecular basis for biofuel production.

Haiyan Huang, Ph.D. University of Southern California. Biophysical BASIS.

Ehud Isacoff, Ph.D. McGill University. Structural dynamics, optical methods, computational methods and visual test design, nonlinear analysis of visual processes.

Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

Eva Nogales, Ph.D. University of California, Berkeley. Molecular mechanisms underlying function of cytoskeleton in cell division and of molecular machines in nucleic acid translocations.

Abby Dernburg, Ph.D. University of California, San Francisco. Biophysical BASIS.

Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

Eva Nogales, Ph.D. University of California, Berkeley. Molecular mechanisms underlying function of cytoskeleton in cell division and of molecular machines in nucleic acid translocations.

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Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

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Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

Eva Nogales, Ph.D. University of California, Berkeley. Molecular mechanisms underlying function of cytoskeleton in cell division and of molecular machines in nucleic acid translocations.

Abby Dernburg, Ph.D. University of California, San Francisco. Biophysical BASIS.

Jamie H. D. Cate, Ph.D. Yale University. Molecular basis for biofuel production.

Teresa Head-Gordon, Ph.D. Carnegie-Mellon University. Biophysics, bioanalytical, and physical chemistry.

Eva Nogales, Ph.D. University of California, Berkeley. Molecular mechanisms underlying function of cytoskeleton in cell division and of molecular machines in nucleic acid translocations.

Abby Dernburg, Ph.D. University of California, San Francisco. Biophysical BASIS.

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Abby Dernburg, Ph.D. University of California, San Francisco. Biophysical BASIS.

Jamie H. D. Cate, Ph.D. Yale University. Molecular basis for biofuel production.
Courses of Instruction
A wide variety of appropriate courses from a number of departments is available to candidates for either the M.A. or the Ph.D. degree, giving both programs considerable flexibility. Flexibility allows students in consultation with the graduate adviser to arrange an individualized program. See Public Health and Statistics in this catalog for a basis.

Buddhist Studies
(College of Letters and Science)

Group Office: 3413 Dwinelle Hall, (510) 642-3480
buddhiststudies.berkeley.edu

Director: Robert Sharf

Professors
Robert P. Goldman, Ph.D. University of Pennsylvania.
(South and Southeast Asian Studies)

Eleanor Rosch, Ph.D. Harvard University. (Psychology)

Alexander von Rospatt, Ph.D. University of Hamburg. (South and Southeast Asian Studies)

Robert Sharf (The D. H. Chen Distinguished Professor of Buddhist Studies), Ph.D. University of Michigan. (East Asian Languages and Cultures)

Joanna Williams, Ph.D. Harvard University. (History of Art)

Padmanabh S. Jain (Emeritus), Ph.D.

Lester Lewis R. Lancaster (Emeritus), Ph.D.

Associate Professors
Patricia Berger, Ph.D. University of California. (History of Art)

Penelope Edwards, Ph.D. Monash University. (South and Southeast Asian Studies)

Gregg Luebben, Ph.D. Princeton University. (History of Art)

Assistant Professor
Jacob Dalton, Ph.D. University of Michigan. (East Asian Languages and Cultures, and South and Southeast Asian Studies)

Graduate Adviser: Contact the Buddhist studies office at (510) 642-3480.

Group in Buddhist Studies

Undergraduate Program
There is currently no undergraduate degree in Buddhist studies. However, the Department of East Asian Languages and Cultures offers a minor in Buddhism, and the Group in Religious Studies offers an emphasis in Buddhism. Undergraduate courses with a Buddhist emphasis can also be found in the Departments of History of Art and South and Southeast Asian Studies.

Graduate Program
The Berkeley Group in Buddhist Studies offers an interdisciplinary program of study and research leading to a Ph.D. degree in Buddhist studies. The group, which cooperates closely with the Departments of South and Southeast Asian Studies (SESEAS) and East Asian Languages and Cultures (EALC), emphasizes the study of Buddhism in its many forms within its Asian historical and cultural contexts.

The ability to read and analyze Buddhist texts in their original languages is an indispensable skill for research in the field. Accordingly, the study of classical Asian languages constitutes a core element of the doctoral program. The specific composition of Asian languages required for the Ph.D. will depend on each student's area of research, but all students will be expected to gain facility in at least two of Asian languages, at least one of which will be classical Chinese, classical Japa-

tes. Because of Berkeley’s particular strength in the area of Buddhist visual culture (three of the group’s faculty are specialists in Buddhist art), all students in the program are expected to take at least one course in art history. In addition, depending on their research interests, students are encouraged to do additional work in fields such as anthropology, economics, history, literature, philosophy, or sociology. A goal of our program is not only to provide students with the linguistic, methodological, and conceptual skills to produce significant new research on Buddhist phenomena, but also to have students bring their research into dialogue with ongoing issues and concerns in the humanities.

The Ph.D. program in Buddhist studies is designed for students who intend to become scholars and teachers of Buddhism. One of the conditions for entering the Ph.D. program must have a master's degree in a relevant field, typically East Asian, South Asian, or Southeast Asian studies. A master's degree in religion is deemed relevant only if it includes significant training in an Asian language relevant to their intended area of research at the time of admission.

For application procedures, financial support, and program requirements, visit the Buddhist studies website.

Lower Division Courses

39. Freshman/Sophomore Seminar. Course may be repeated for credit. One unit of lecture per week. This course is a survey of the main themes in the history of Japanese Buddhism as they are treated in modern scholarship. The course covers the transmission of Buddhism from China and Korea to Japan; the subsequent evolution in Japan of the Tendai, Shingon, Pure Land, Nichiren, and Zen schools of Buddhism; the organization and function of Buddhist institutions (monastic and lay) in Japanese society; the intersection between Buddhism and other modes of religious belief and practice prevalent in Japan, notably those that go under the headings of “Shinto” and “folk religion.” Also listed as Japanese C115. (F. SP) Staff

C120. Buddhism on the Silk Road. (4) Three hours of lecture per week. Formerly Buddhism 120. This course is both a historical introduction to the Silk Road, understood as an ever-changing series of peoples, places, and traditions, as well as an introduction to the study of Buddhism in its historical and cultural contexts. It brings together the group’s faculty to offer an interdisciplinary seminar on the origins, development, and influence of Buddhism in the context of the Silk Road. The course is scheduled for Fall and Spring. (F, SP) Staff

C50. Introduction to the Study of Buddhism. (4) Three hours of lecture and one hour of discussion per week. This course will consider materials drawn from various Buddhist traditions of Asia, from ancient times to the present day. However, it is not intended to be a comprehensive or systematic survey; rather than aiming at breadth, it is designed around key themes such as ritual, image veneration, mysticism, meditation, and death. The overarching emphasis throughout the course will be on the hermeneutic difficulties attendant upon the study of religion in general, and Buddhism in particular. (F. SP) Staff

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98. Directed Group Study for Lower Division Students. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing. 3.5 GPA. Small group instruction in topics not covered by regularly scheduled courses. (F. SP) Staff

99. Independent Study for Lower Division Students. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing. 3.5 GPA.

Independent study in topics not covered by regularly scheduled courses. (F. SP) Staff

Upper Division Courses

C114. Tibetan Buddhism. (4) Three hours of lecture per week. Formerly Buddhism 114. This course is a broad introduction to the history, doctrine, and culture of the Buddhism of Tibet. It traces the introduction of Buddhism to Tibet in the eighth century and move on to the evolution of the major schools of Tibetan Buddhism, Tibetan Buddhist literature, ritual and monastic practice, the influence of Buddhism in Tibetan political history, and the contemporary situation of Tibetan Buddhism both inside and outside of Tibet. Also listed as South Asian C114 and Tibetan C114. (F. SP) Staff

C115. Japanese Buddhism. (4) Three hours of lecture per week. Formerly Buddhism 115. A critical survey of the main themes in the history of Japanese Buddhism as they are treated in modern scholarship. The course covers the transmission of Buddhism from China and Korea to Japan; the subsequent evolution in Japan of the Tendai, Shingon, Pure Land, Nichiren, and Zen schools of Buddhism; the organization and function of Buddhist institutions (monastic and lay) in Japanese society; the intersection between Buddhism and other modes of religious belief and practice prevalent in Japan, notably those that go under the headings of “Shinto” and “folk religion.” Also listed as Japanese C115. (F. SP) Staff

C120. Buddhism on the Silk Road. (4) Three hours of lecture per week. Formerly Buddhism 120. This course is both a historical introduction to the Silk Road, understood as an ever-changing series of peoples, places, and traditions, as well as an introduction to the study of Buddhism in its historical and cultural contexts. It brings together the group’s faculty to offer an interdisciplinary seminar on the origins, development, and influence of Buddhism in the context of the Silk Road. The course is scheduled for Fall and Spring. (F, SP) Staff

C122. Buddhist Meditation: Historical, Doctrinal, and Ethnographic Perspectives. (4) Three hours of lecture and one hour of discussion per week. This course will explore the nature and function of Buddhist meditation as it developed within various Buddhist traditions of South, Southeast, and East Asia. Emphasis will be on the historical evolution, doctrinal foundations, and monastic and extra-monastic regimes associated with Buddhist meditation practices. We will make use of a wide variety of primary and secondary readings as well as visual materials (including films) to attempt to place the historical and doctrinal accounts within their cultural and institutional contexts. Also listed as East Asian Languages and Cultures C122. (F. SP) Staff

C124. Buddhism and Film. (4) Three to four hours of discussion/film screening per week. Formerly Buddhism 124. This course will use the medium of film to explore various themes in the study of Buddhism. At the same time, we will use ideas culled from Buddhism to reflect back on the nature and power of film. We will be screening a wide variety of international and domestic films, from Hollywood blockbusters to small independent films and documentaries. Themes to be considered include the epistemic status of the viewing subject, the place of imagination and visualization in Buddhist mediation and ritual, contesting Asian and Western notions of Buddhist authority, Orientalism, and the role of projection and fantasy in cinematic representations of Buddhism. The films will be accompanied by primary and secondary readings in Buddhist art, religious studies, and film theory. Also listed as East Asian Languages and Cultures C124. (F. SP) Staff

C126. Buddhism and the Environment. (4) Three hours of lecture per week. Formerly Buddhism 126. The course will provide an overview of the role of Buddhism in modern environmental movements. It will include a review of the history of Buddhism and its relationship to nature, as well as an exploration of the recent development of environmental Buddhism. The course will be offered in the Fall and Spring. (F, SP) Staff
mental issues. The first half of the course focuses on East Asian Buddhist cosmological and doctrinal perspectives on the place of the human in nature and the role of the savior-god within Buddhist tradition. The second half of the course examines Buddhist ethics, economics, and activism in relation to environmental issues in contemporary East Asia. It will serve as an introduction to East Asian, and Asia, and will be listed as East Asian Languages and Cultures C126. (F.SP) Williams

C128. Buddhism in Contemporary Society. (4) Three hours of lecture per week. A study of the Buddhist tradition as it is found today in Asia. The course will focus on the changing traditions of East, South, and/or Southeast Asia. Themes to be addressed may include contemporary Buddhist ritual practices; funerary and mortuary customs; the relationship between Buddhism and the state; the relationship between Buddhism and society; the relationship between political power and religion; the relationship between Buddhism and the state; the problems involved in understanding a sophisticated religious tradition that emerged in a time and culture very different from our own. Also listed as East Asian Languages and Cultures C128. (F.SP) Staff

C130. Zen Buddhism. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One lower-division course in Asian religion recommended. Formerly Buddhism C130. This course will introduce students to the Zen Buddhist traditions of China and Japan, drawing on a variety of disciplinary perspectives (history, anthropology, philosophy, and so on). The course covers a range of heretical problems (problems involved in interpretation) entailed in understanding a sophisticated religious tradition that emerged in a time and culture very different from our own. Also listed as East Asian Languages and Cultures C130. (F.SP) Staff

C135. Tantric Traditions of Asia. (4) Three hours of lecture per week. Prerequisites: One course in Buddhist studies or consent of instructor. The emergence of the tantras in seventh- and eighth-century India marked a new direction in the study of Buddhism in India and Asia. These esoteric scriptures introduced complex new ritual technologies that transformed the religious traditions of India, from Brahmanism to Jainism and Buddhism, and the religious practices of those of Southeast Asia, Tibet, Mongolia, China, Korea, and Japan. This course provides an overview of tantric religion across these regions. Also listed as East Asian Languages and Cultures C135 and South and Southeast Asian Studies C135. (F.SP) Staff

C140. Readings in Chinese Buddhist Texts. (4) This course is intended for students who already have some facility in literary Chinese. Three hours of lecture per week. Prerequisites: MA or consent of instructor. Prior background in Buddhist history and thought is helpful but not required. This course is an introduction to the study of medieval Buddhist literature written in classical Chinese. We will read samples from a variety of genres, including early Chinese translations of Sanskrit and Central Asian Buddhist scriptures, indigenous Chinese commentaries, philosophical treatises, and sectarian works, including Chan gongan (Zen) loans. The course will also serve as an introduction to resource materials used in the study of Chinese Buddhist texts, and students will be expected to make use of a variety of reference tools in preparation for class. Readings in Chinese will be supplemented by a range of secondary readings in English on Mahayana doctrine and Chinese Buddhist history. Also listed as Chinese C140.

C154. Death, Dreams, and Visions in Tibetan Buddhism. (4) Three hours of lecture per week. Tibetan Buddhist beliefs and practices regarding death as a rare opportunity for transformation. This course examines how Tibetans have used death and dying in the path to enlightenment. Readings will address how Tibetan funerals assist in the dying process as well as the dying process itself, and how Buddhist practitioners prepare for this crucial moment through tantric meditation, imagina-
tive rehearsals, and explorations of the dream state. Also listed as both C154 and South Asian Studies C154. (F.SP) Dalton

C174. Japanese Buddhism in Diaspora. (4) Three hours of lecture per week. Prerequisites: One lower-division course in Buddhist studies or consent of instructor. Japanese Buddhist Diaspora: Buddhism in the late 19th and early 20th centuries in its encounters with modernity, colonialism, and immigration history. Looking at the Japanese diaspora around the world, this course will explore the relations of Japan with Buddhist Buddhism’s relationship with the Meiji state, State Shinto, Christianity, and the West. Regions covered include Manchuria, Korea, Hawaii, the United States, Canada, and Brazil. Also listed as Japanese C174. (F.SP) Williams

190. Topics in the Study of Buddhism. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Some prior study of Buddhism or Asian culture is recommended. This course will focus on current developments and issues in the study of Buddhism. The course is intended to supplement our regular curricular offerings, and the content will change from semester to semester. (F.SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Junior or senior standing. Independent study in topics not covered by regularly scheduled courses. (F.SP) Staff

200. Proseminar in Buddhist Studies. (1) Course may be repeated for credit as topic varies. Three hours of seminar every third week. Prerequisites: Graduate standing in the Buddhist Studies Ph.D. Program or consent of instructor. This seminar provides for an opportunity for all students and faculty in the Group in Buddhist studies to gather together on a regular basis to discuss theoretically significant works in the field of Buddhist studies, as well as pertinent and important works in related disciplines (anthropology, art history, literature, history, philosophy, and religious studies). The content of the course will be adjusted from semester to semester so as to best accommodate the needs and interest of the students, but the focus will be on recent works representing the “state of the art” in the field. Also listed as Chinese C220. (F,SP) Rospatt

C215A. Readings in Indian Buddhist Texts. (2,4) This course is designed for students working on premodern Japanese culture (literature, philosophy, and art). The course will focus on specific themes, developments, and issues in the study of Buddhism. The course is intended to supplement our regular curricular offerings, and the content will change from semester to semester. (F.SP) Staff

C215B. Readings in Indian Buddhist Texts. (2,4) This course is designed for students working on premodern Japanese culture (literature, philosophy, and art). The course will focus on specific themes, developments, and issues in the study of Buddhism. The course is intended to supplement our regular curricular offerings, and the content will change from semester to semester. (F.SP) Staff

C220. Seminar in Buddhism and Buddhist Texts. (2,4) Three hours of seminar per week. Formerly Buddhist Texts. This seminar will focus on readings and issues in the study of Buddhism that exist in multiple recensions and languages, including Chinese, Sanskrit, and Tibetan. Also listed as East Asian Languages and Cultures C220. (F.SP) Staff

C223. Readings in Chinese Buddhist Texts. (2,4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Buddhism C223. This seminar is an intensive introduction to various genres of Buddhist literature in classical Chinese, including translations of Sanskrit and Central Asian scriptures. Chinese commentaries, philosophical treatises, hagiographies, and sectarian works. It is intended for graduate students who are looking for facility in classical Chinese. It will also serve as a “tools and methods” course, covering the basic reference works and secondary scholarship in the field of East Asian Buddhism. The content of the course will be adjusted from semester to semester to best accommodate the needs and interests of students. Also listed as Chinese C223. (F.SP) Staff

C224. Readings in Tibetan Buddhist Texts. (2,4) Three hours of seminar per week. Formerly Tibetan C224. This seminar will focus on reading a wide spectrum of Indian Buddhist texts in the Sanskrit (or Pali) original introducing the students to different genres and different aspects of Indian Buddhism. The students taking the course for 2 units (rather than 4) will be expected to prepare thoroughly every week for the reading of Buddhist texts in the original. They will also be expected to read all related secondary literature that is assigned to supplement the study of the primary source material. The content of the course will vary from semester to semester to account for the needs and interests of particular students. Also listed as South Asian C224 and Tibetan C224. (F.SP) Dalton

C225. Readings in Japanese Buddhist Texts. (2,4) Three hours of seminar per week. Prerequisites: Consent of instructor. This seminar will focus on reading a wide spectrum of Indian Buddhist texts in the Sanskrit (or Pali) original introducing the students to different genres and different aspects of Indian Buddhism. The students taking the course for 2 units (rather than 4) will be expected to prepare thoroughly every week for the reading of Buddhist texts in the original. They will also be expected to read all related secondary literature that is assigned to supplement the study of the primary source material. In contrast to the students taking the course for 4 units, they will not be expected to write a term paper or to prepare special presentations for class. Also listed as South Asian C225. (F.SP) Rospatt

220. Seminar in Buddhism and Buddhist Texts. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. Content varies with student interest and needs. The course will normally focus on classical Buddhist texts that exist in multiple recensions and languages, including Chinese, Sanskrit, and Tibetan. Also listed as East Asian Languages and Cultures C220. (F.SP) Staff
C240. Readings in Chan and Zen Buddhist Literature, (2.4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Open to students of Japanese or Korean, as well as familiarity with East Asian history and culture. Formerly Buddhism 240. This graduate seminar is an intensive introduction to primary sources used in the study of Chan and Zen Buddhism. It is designed to be of interest to a range of graduate students working on premodern Chinese and Japanese culture (literature, philosophy, intellectual history, religion, art, etc.). The seminar will also introduce students to Asian and Western language reference tools for the study of East Asian Buddhist texts, including web resources. The content of the course will vary from semester to semester to reflect the current needs and interests of students. Also listed as East Asian Languages and Cultures C240. (F,SP) Staff

298. Directed Study for Graduate Students, (1-8) Course may be repeated for credit as texts vary. Hours to be arranged. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F,SP) Staff

299. Thesis Preparation and Related Research, (1-8) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of thesis supervisor and graduate adviser. (F,SP) Staff

601. Individual Study for Master’s Students, (1-8) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of graduate adviser. Individual study for the comprehensive or final examination for the master's degree. Students must prepare in consultation with the graduate adviser. Units may not be used to meet either unit or residence requirements for a master's degree. (F,SP) Staff

602. Individual Study for Doctoral Students, (1-8) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for the qualified student to prepare for various examinations required of candidates for the Ph.D. (F,SP) Staff

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Business Administration
(Walter A. Haas School of Business)

Office: S545 Student Services Building #1900
haas Berkeley
Dean: Richard K. Lyons, Ph.D.
Associate Deans: Loding Economic Aff airs: Andrew K. Rose, Ph.D.
Senior Assistant Dean for Instruction: Jay Stokes, Ph.D.

Directors:
David Gerr, M.B.A. (Evening & Weekend M.B.A. Program)
Katharine Ulyen, M.B.A. (Berkeley Executive M.B.A. Program)
Erika Walker, B.A. (Undergraduate Program)
Julia Min Huang, M.A. (M.B.A. Program)
Kiran Krestman, Ph.D. (Master’s in Financial Engineering Program)
Sunil Dutta, Ph.D. (Ph.D. Program)

Professors
Severin Borenstein (The Edwin T. Grether Chair in Business Administration and Public Policy, Ph.D. Massachusetts Institute of Technology, Industrial organization and government regulation, law and economics, applied microeconomic theory)
Tom Campbell, Ph.D. (University of Chicago, J.D. Harvard University, Organization, socialization, commitment)
Patrik Dejvorse (The Donald H. and Ruth F. Seiler Chair in Financial Engineering and International Business, Ph.D. University of Minnesota, International financial engineering, insurance)
Robert H. Edelstein (The Maurice Mann Chair in Real Estate, Ph.D. Harvard University, Real estate finance and institutions

Paul J. Gertler (The Li Ka Shing Foundation Chair in Health Management, Ph.D. University of Wisconsin, Development, microeconomics, health services)
Rash H. Glazer, Ph.D. (Stanford University, Marketing strategy, development)
Heather A. Haveman, Ph.D. (University of California, Berkeley, Organizational theory, economic sociology, historical sociology)
Robert W. Heiseley (The Chair in Real Estate Development, Ph.D. Princeton University, Specialization, applied microeconomics, and real estate markets)
Benjamin E. Hermalin, Ph.D. (The Thomas A. Schneider Distinguished Professorship in Finance, Ph.D. Massachusetts Institute of Technology, Theory of contracts, mechanisms design)
Teck H. Ho (The William H. and Flora H. Latimer Chair in Finance, Ph.D. University of Michigan, Quantitative marketing, economic sustainability, applied microeconomics)
Erika Walker, B.A. (The Blue Cross of California Master’s in Financial Engineering Program, Ph.D. University of California, Berkeley, Organizational behavior, negotiations, justice, judgment, and decision making, Vice President, Vice President)
Jonathan S. Leonard (The George E. Curry Chair in Business Ethics, Ph.D. Harvard University, Employment, productivity, collective bargaining)
Martin Lettau, Ph.D. (The Bernard T. Rocca Chair in Finance and Accounting, Ph.D. University of California, Berkeley, Applied economics and macroeconomics of finance)
David J. Levine (The Thomas M. Treffern Chair in Business Administration, Ph.D. Harvard University, Macroeconomics, labor, and corporate investment)
James R. Lincoln (The Mitsubishi Bank Chair in International Business and Finance, Ph.D. University of Wisconsin, Organization theory, Japanese management, Vice President)
Laura Kray (The Sarin Chair in Strategy and Leadership, Ph.D. Oxford University, Competitive strategy, microeconomics, managerial compensation)
Michael L. Katz (The Sain Chair in Strategy and Leadership, Ph.D. Oxford University, Competitive strategy, microeconomics, managerial compensation)

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Robert W. Heiseley (The Chair in Real Estate Development, Ph.D. Princeton University, Specialization, applied microeconomics, and real estate markets)
Benjamin E. Hermalin, Ph.D. (The Thomas A. Schneider Distinguished Professorship in Finance, Ph.D. Massachusetts Institute of Technology, Theory of contracts, mechanisms design)
Teck H. Ho (The William H. and Flora H. Latimer Chair in Finance, Ph.D. University of Michigan, Quantitative marketing, economic sustainability, applied microeconomics)
Erika Walker, B.A. (The Blue Cross of California Master’s in Financial Engineering Program, Ph.D. University of California, Berkeley, Organizational behavior, negotiations, justice, judgment, and decision making, Vice President, Vice President)
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James R. Lincoln (The Mitsubishi Bank Chair in International Business and Finance, Ph.D. University of Wisconsin, Organization theory, Japanese management, Vice President)
Laura Kray (The Sarin Chair in Strategy and Leadership, Ph.D. Oxford University, Competitive strategy, microeconomics, managerial compensation)
The highly competitive, two-year Haas Undergraduate Program Accepts applications from both transfer and continuing Berkeley applicants. The program’s goal is to provide students with the knowledge and technical skills necessary to understand the modern business world, prepare for subsequent graduate work, and achieve the highest levels of success in their professional careers. Students earn a Bachelor of Science degree that takes a general management perspective. Course-work is fully integrated with the University’s liberal arts curriculum, allowing students to gain a broad perspective and understand the interdependencies of business management and its environment. Students are challenged to develop creative and innovative solutions to contemporary business problems and to develop leadership skills and a sense of community service through class- room experiences and extracurricular activities.

Students preparing for admission to the Undergraduate Program may complete required lower division courses in any college in the University or equivalent courses at other institutions. Before applying to the school, you should visit our website at haas.berkeley.edu/undergrad. The website contains complete information concerning academic qualifications for admission, with details about prerequisites and degree requirements. Because there are many more applicants than spaces available, completion of the prerequisites does not guarantee admission. Upon admission, business majors must take the following upper-division core courses at Haas:

UGBA 100 — Business Communication
UGBA 101A — Microeconomics Analysis for Business Decisions
UGBA 101B — Macroeconomics Analysis for Business Decisions
UGBA 102A — Introduction to Financial Accounting
UGBA 102B — Introduction to Managerial Accounting
UGBA 103 — Introduction to Finance
UGBA 104 — Analytic Decision Modeling Using Spreadsheet
UGBA 105 — Organizational Behavior

UGBA 106 — Marketing
UGBA 107 — Social, Political, and Ethical Environment of Business

Beyond these required core courses and other courses outside the Haas School needed to fulfill the degree requirements, business majors must complete an additional 11 business disciplines: accounting, business and public policy, corporate social responsibility, economic analysis and policy, entrepreneurship, finance, management of organizations, marketing, non-profit management, operations and information technology management, and real estate.

Contact Information: Haas School of Business, University of California, Berkeley, $450 Student Services Building #1900, Berkeley, CA 94720-1900; (510) 642-1421; or haas.berkeley.edu/undergrad.

Graduate Degrees

The Haas School of Business offers curricula leading to the Master of Business Administration degree, Master’s in Financial Engineering, and the Ph.D. degree. The Haas School offers three M.B.A. programs: a two-year program for full-time students, the Evening & Summer M.B.A. Program, and the Berkeley-Columbia Executive M.B.A., a 19-month program for senior professionals.

Full-Time M.B.A. Program

The Full-Time M.B.A. Program at the Haas School of Business offers an unsurpassed education in the fundamentals of management and in-depth exposure to the trends shaping the foundations of business. It brings together men and women from around the world and teaches them to be innovative leaders in any type of organization. At the end of the two-year program, students will receive the Berkeley MBA, embodying a spirit of challenge that will become their approach to leadership throughout their professional lives. Students learn to pursue new ideas aggressively, defy convention, and lead through innovation. In addition, the program is shaped by its flexible curriculum, distinguished faculty, and strong connections with business in nearby Silicon Valley and the San Francisco Bay Area.

Students are marked by a unique blend of entrepreneurial drive and extracurricular activities, combined with serious scholarship and a global outlook. With approximately 33 percent international students (evenly divided between Europe, Asia, and South America), and 30 percent for the program, reflects the diverse global environment in which its graduates will pursue their careers. The diverse student body of some 480 students represents more than 200 colleges and universities, 40 countries, and a wide range of academic and professional backgrounds.

The Haas School co-sponsors four concurrent-degree programs:

• M.B.A./J.D. with Berkeley Law or Hastings College of the Law;
• M.B.A./M.P.H. in health services management with the School of Public Health; and
• M.B.A./M.A. in international and area studies.

Curriculum: Students in the full-time program must complete 51 semester units to graduate: 21 units of core required courses and 30 units of electives. Students who pass a waiver exam may replace core courses with electives. For a complete list of graduation requirements, visit haas.berkeley.edu/academics/academic/graduation-requirements.html.

Students outside the M.B.A. Program may take courses on a space-available basis only. They should consult the Full-Time M.B.A. Program Office directly before attempting to register for courses.

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Exchange Programs. The Haas School offers several exchange programs with some of the finest business schools in Europe, Asia, and North America. The following schools participate: London Business School in Great Britain, L’Ecole des Hautes Etudes Commerciales (HEC) outside Paris, the Rotterdam School of Management in the Netherlands, IESE Business School in Barcelona, Columbia Business School in New York City. In addition, the Washington Campus Program in Washington, D.C., and the M.B.A. Enterprise Corps in emerging economies provide Berkeley students with opportunities to enhance their education.

Admission. Applications for the Full-Time M.B.A. Program are accepted for fall entry only. Typically, the school receives 3,000-4,000 applications for about 240 positions in the entering class. The average age of entering students is 28 years and all have significant full-time business experience before entering the program.

We admit candidates with substantial professional experience and considerable leadership potential who come from a wide variety of industries and backgrounds. In addition, we seek candidates who will add to the richness of the classroom experience and participate actively in the Haas community.

Applications. Students in the Evening & Weekend M.B.A. Program complete 42 units to graduate, including 18 units of required core courses, 1 unit for a Mid-Career Leaders (MCL) requirement, and 23 units of elective courses, including an experimental learning elective to fulfill the Berkeley Inno- lative Leader Development (BILD) curriculum requirement. Berkeley M.B.A. classes are held on the Berkeley campus Monday through Thursday from 6 p.m. to 9:30 p.m. Students attend classes two nights per week. Weekend classes are held Sat- urdays from 8 a.m. to 6 p.m. and alternate between a South Bay campus and a campus in the San Francisco Bay area. Evening & Weekend M.B.A. Program applications online at ewmba.haas.berkeley.edu/apply.html. For more information, contact the Evening & Weekend M.B.A. Program, 2220 Piedmont Avenue, Berkeley, California, Berkeley, Mail Code #1906, Berkeley, CA 94720-1906; (510) 642-0292; or ewmba.haas.berkeley.edu.

Master’s of Financial Engineering Program

The Master’s of Financial Engineering (M.F.E.) degree is a full-time, one-year graduate degree offered by the Haas School of Business. Students enrolled in the M.F.E. Program learn to use the fundamental tools of financial engineering and quantitative methods, including advanced mathematics and computer programming skills to model pricing, hedging, trading, and portfolio management decisions.

Admission is extremely competitive, with 60 students admitted annually. The program starts and ends during the spring semester, and applications are accepted only for spring enrollment. In addition to meeting the UC Berkeley Graduate Division admissions requirements, applicants should have solid backgrounds in advanced mathematics and computer programming. Most students admitted to the program have academic and work experi- ence in engineering, finance, statistics, physics, economics, and computer science.

The M.F.E. curriculum consists of 28 units of coursework taken over four terms of eight weeks each. Advanced courses cover topics in credit risk modeling, derivatives pricing, fixed income se- curities, bond portfolio management, equity and currency markets, corporate finance, dynamic asset management, arbitrage, hedging, futures and options pricing, trading, and dynamic investment strategies. An applied finance project of 1-3 credits and 4-6 units of an optional course, which may have transfers from other universities and programs are not accepted.

Graduates of the M.F.E. Program find positions in commercial and investment banking, insurance and reinsurance, merchandising, corporate strategy, and money management. Specializa- tions include risk management, asset/liability modeling/optimization, security structuring, deriva- tive valuation and trading, consulting, asset management, research, option-based securities valuation, special hedging, and real-option investment analysis.

For complete admissions, curriculum, and pro- gram information, visit the Master’s of Financial Engineering Program’s website at mfe.haas.berkeley.edu.

The Ph.D. Program

The Ph.D. Program of the Haas School of Business is an advanced and scholarly course of study in the functioning of business and its interaction with the environment. It combines an in-depth examination of one or more of the traditional fields of study in business administration with a broader, integrative investigation of basic and applied theory in the social sciences and quantitative methods. Fields of study include accounting, business

Undergraduate Business Administration

Lower Division Courses

10. Principles of Business. (3) Three hours of lecture and one hour of discussion per week. Formerly Business Administration 10. This course provides an introduction to the study of the modern business enterprise. The course is taught in five modules, the order of
which may vary from semester to semester. The first examines the role and governance of business enterprise in a market economy. The second concentrates on financial issues while the third looks at the problems of managing people in organizations. The fourth examines product pricing, marketing, and distribution issues, and the last concentrates on the international business environment. (F, SP)

24. Freshmen Seminars. (1) Course may be repeated for credit. One hour of lecture per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Formerly Business Administration 24. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F, SP)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sophomores. Formerly Business Administration 39. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F, SP)

96. Lower Division Special Topics in Business Administration. (1-4) One to four hours of lecture per week. Study in various fields of business administration for lower division students. Topics will vary from semester to semester and will be announced at the beginning of each semester. (F, SP)

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three to 12 hours of group study per week. Must be taken on a passed/not passed basis. Formerly Business Administration 98. Organized group study on topics selected by lower division students under the sponsorship and direction of a member of the Haas School of Business faculty. (F, SP)

Upper Division Courses

100. Business Communication. (2) Two hours of lecture per week. Formerly Business Administration 100. Theory and practice of effective communication in a business environment. Students practice what they learn in small presentations and written assignments that model real-life business situations. (F, SP)

101A. Microeconomic Analysis for Business Decisions. (3) Students will receive no credit for 101A after taking Economics 100A or 101A or International and Area Studies 106. A deficient grade in Economics 101B may be repeated by taking 101A. Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics 21, or equivalents. Formerly Business Administration 110. Economic analysis applicable to the problems of business enterprises with emphasis on the determination of the level of prices, outputs, and resource effects. (F, SP)

101B. Macroeconomic Analysis for Business Decisions. (3) Students will receive no credit for 101B after taking Economics 100B or 101B or International and Area Studies 107. A deficient grade in Economics 100B, 101B, or International and Area Studies 107 may be repeated by taking 101B. Three hours of lecture and one hour of optional discussion per week. Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics 21, or equivalents. Formerly Business Administration 111. Analysis of the operation of the market system with emphasis on the factors responsible for economic fluctuations and analysis of public and business policies which are necessary as a result of business fluctuations. (F, SP) Staff

102A. Introduction to Financial Accounting. (3) Three hours of lecture and one hour of discussion per week. Formerly Business Administration 120. The identification, measurement, and reporting of financial effects of events on enterprises, with a particular emphasis on business organization. Preparation and interpretation of balance sheets, income statements, and statements of cash flows. (F, SP)

102B. Introduction to Managerial Accounting. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 102A. Formerly Business Administration 122. The uses of accounting systems and their outputs in the process of management of an enterprise. Interpretation of topics in cost accounting and general bases for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making. (F, SP)

103. Introduction to Finance. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 101A. Formerly Business Administration 130. Analysis and management of the flow of funds through an enterprise. Cash management, source and application of funds, term loans, types and sources of long-term capital. Capital budgeting, cost of capital, and financial structure. Introduction to capital markets. (F, SP)

104. Analytic Decision Modeling Using Spreadsheets. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics 21, or equivalents. This course provides an introduction to several quantitative methods used to facilitate complex decision making in business, with applications in many different industries. Topics include linear programming, and with different scopes of decisions. The power of the methods covered in this class is further enhanced by implementing them in spreadsheet software, which allows complex problems to be approached and solved in a straightforward and understandable manner. (F, SP) Staff

105. Introduction to Organizational Behavior. (3) Students will receive no credit for 105 after taking Psychology 130 or Organizational Behavior 131. Prerequisites: Economics 1, Psychology 180 or Industrial Engineering and Operations Research 171. A deficient grade in Psychology 180 or Industrial Engineering and Operations Research 171 may be repeated by taking 105. Three hours of lecture per week. Formerly Business Administration 150. A general descriptive and analytical study of organizations from the behavioral science point of view. Problems of motivation, leadership, morale, social structure, group, communication, hierarchy, and control in complex organizations are addressed. The interaction among technology, environment, and human behavior are considered. Alternate theoretical models are discussed. (F, SP)

106. Marketing. (3) Three hours of lecture per week. Formerly Business Administration 160. The evolution of markets and marketing; market structure; marketing cost and efficiency; public and private regulation; the development of marketing programs including decisions involving products, price, promotional distribution. (F, SP)

107. The Social, Political, and Ethical Environment of Business. (3) Three hours of lecture or two hours of lecture and one hour of discussion per week. Formerly Business Administration 170. Study and analysis of the social and political environment. Interaction between business and other institutions. Role of business in the development of social values, goals, and national priorities. The effects on the state of the competitive environment on business and government policies. (F, SP)

120A. Intermediate Financial Accounting. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 102A. Formerly Business Administration 121. An intermediate-level course in the theory and practice of financial accounting and reporting and forecasting the effect of events involving working capital and long-term plant assets, investment in securities, intangible assets. (F, SP)

120B. Advanced Financial Accounting. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 102A, 120A. Formerly Business Administration 122. Continuation of 120A. Sources of long-term capital; funds statements, financial analysis, accounting for partnerships, consolidated financial statements, adjustments to financial statements, accounting for the economic effect of events involving working capital and long-term plant assets, investment in securities, intangible assets. (F, SP)

121. Federal Income Tax Accounting. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 102A (120A recommended). Formerly Business Administration 125. Determination of individual and corporation tax liability; influence of federal taxation on economic activity; tax considerations in business and investment decisions. (F, SP)

122. Financial Information Analysis. (3) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120A (120B recommended). Formerly Business Administration 129. Use of financial statements and ratio analysis in decision making. Interpretation of financial data used in a variety of decision contexts, such as equity valuation, forecasting firm-level economic variables, distress prediction and credit analysis; and (3) help students appreciate the factors that influence the outcome of the financial analysis, such as the incentives of reporting parties, regulatory rules, and a firm’s competitive environment. (F, SP) Staff

126. Auditing. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: 120A (120B recommended). Formerly Business Administration / 153

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B prefix=language course for business majors
C prefix=course cross-listed course
H prefix=honors course
R prefix=course satisfies R&Q requirement
A suffix=course satisfies American Cultures requirement
W prefix=online course
F prefix=course fulfills General Education requirement
†Recipient of Distinguished Teaching Award
147. Special Topics in Manufacturing and Information Technology. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: Business Administration 140. Formerly Business Administration 149. A variety of topics in manufacturing and information technology with emphasis on current problems and research. (F,SP) Staff

149A. Information Technology Strategy. (3) Three hours of lecture per week. This course focuses on the use of IT by traditional firms and startups, rather than the details of the technology, with the goals of understanding how IT influences strategy and how traditional IT systems can be adapted to IT innovations. Covers IT technologies used throughout the organization, including mobile communications, systems for online payment, business-to-consumer and business-to-business transactions, customer relationship management, and supply chain management. (F,SP) Staff

151. Management of Human Resources. (3) Three hours of lecture per week. Prerequisites: 105. Formerly Business Administration 151. The design of systems to reward, assess, and to empower development. The interaction of selection, placement, training, personnel evaluation, and career ladders within an ongoing organization. Role of the staff manager. Introduction of change. Implications of behavioral research for management problems and policies. (F,SP)

152. Negotiation and Conflict Resolution. (3) Three hours of lecture per week. Prerequisites: 105. Formerly Business Administration 152. The purpose of this course is to understand the theory and processes of negotiation as practiced in a variety of settings. It is designed to be relevant to the broad spectrum of negotiation problems faced by managers and professionals. By focusing on the behavior of individuals, groups, and organizations in the context of competitive situations, the course will allow students the opportunity to develop negotiation skills experimentally in useful analytical frameworks (e.g. simulations, cases). (F,SP) Staff

155. Leadership. (3) Three hours of lecture per week. The purpose of this course is for the students to develop understanding of the theory and practice of leadership in various organizational settings. It is designed to develop leadership skills through experiential exercises, behavioral and self-assessments, case studies, class discussions, and lectures. (F,SP) Staff

156. Consumer Behavior. (3) Three hours of lecture per week. Prerequisites: 106. Consumer behavior is the study of how consumers process information, form attitudes and judgments, and make decisions. Its study is critical to understand how consumers think and behave, which is of primary importance in developing a customer focus. Given how different people are, it is amazing how similarly their minds work. Consumer psychology is the systematic study of how consumers perceive information, how they encode it in memory, integrate it with other sources of information, retrieve it from memory, and utilize it to make decisions. It is one of the building blocks of the study of marketing and provides the foundation for a set of tools with diverse applications. (F,SP) Staff

161. Marketing Research: Tools and Techniques for Data Collection and Analysis. (3) Three hours of lecture per week. Prerequisites: 106. Formerly Business Administration 161. Marketing research objectives, qualitative research, surveys, experiments, sampling, data analysis. (F,SP) Staff

162. Brand Management and Strategy. (3) Three hours of lecture per week. Prerequisites: 106. Formerly Business Administration 162. This course is an introduction to product management in marketing consumer and industrial goods and services. The course will cover an analysis of market information, development of product strategy, programming strategy, and implementation. (F,SP) Staff

165. Integrated Marketing Communication. (3) Three hours of lecture per week. Prerequisites: 106. Formerly Business Administration 165. Basic concepts of marketing and their role in the economy; consumer motivation; problems in utilizing advertising and measuring its effectiveness. (F,SP)

167. Special Topics in Marketing. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: 106. Formerly Business Administration 167. A variety of topics in marketing with emphasis on current problems and research. (F,SP)

170. Business Ethics for the 21st Century. (2) Two hours of lecture per week. The purpose of this class is to enhance the ability of students to anticipate, critically analyze, and appropriately respond to the wide range of social and ethical issues that challenge managers as well as individuals in their roles as citizens, consumers, investors, and employees. Instruction is based on lectures and case analysis, supplemented by topical and philosophical articles and essays. (F,SP) Staff

C172. Business in Its Historical Environment. (3) Three hours of lecture per week. Formerly Business Administration C172. This course will examine selected aspects of the history of American business. Included are discussions of the evolution of the corporation, the development of modern managerial techniques, and the changing relationship of business, government, and labor. Also listed as American Studies C172. (F,SP) Rosen

175. Legal Aspects of Management. (3) Three hours of lecture per week. Formerly Business Administration 175. An analysis of the law and the legal process, emphasizing the nature and functions of law within the U.S. federal system, followed by a discussion of legal problems pertaining to contracts and related topics, business association, and the impact of law on economic enterprise. (F,SP)

177. Special Topics in Business and Public Policy. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: 107. Formerly Business Administration 177. A variety of topics in business and public policy with emphasis on current problems and research. (F,SP)

178. Introduction to International Business. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 101A-101B or equivalent. Formerly Business Administration 178. A survey involving environmental, economic, political, and social constraints on doing business abroad; effects of international problems on domestic and foreign economies; foreign market analysis and operational strategy of a firm; management problems and development potential of international operations. (F,SP)

180. Introduction to Real Estate and Urban Land Economics. (3) Three hours of lecture per week. Prerequisites: 101A-101B or equivalent. Formerly Business Administration 180. The nature of real property; market analysis; construction cycles; mortgage lending; equity investment; metropolitan growth; urban land use; real property valuation; public policies. (F,SP)

183. Introduction to Real Estate Finance. (3) Three hours of lecture per week. Prerequisites: 180. Formerly Business Administration 183. Real estate debt and equity financing; mortgage market structure; effects of credit on demand; credit and sales; mortgage tax policies in real estate finance and urban development. (F,SP)

187. Special Topics in Real Estate Economics and Finance. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: 107. Formerly Business Administration 187. A variety of topics in real estate economics and finance with emphasis on current problems and research. (F,SP) Staff
191C. Communication for Leaders. (2) One hour of lecture and two hours of discussion per week. This course is a workshop in the fundamentals of public speaking skills in today’s business environment. Each student will give speeches, coach, and debate each other, and take part in a variety of listening and other communication exercises. The course focuses on authenticity, persuasion, and advocacy. (F,SP) Staff

192A. Managing Nonprofits and Social Ventures. (3) Three hours of lecture per week. Prerequisites: 101A or equivalent. Formerly Business Administration 115. This course prepares students conceptually and practically to found, lead, and manage organizations in the nonprofit sector. The course focuses on mission and theory of change (strategy), role of the board in governance, managing and marketing to multiple constituencies, role of advocacy in meeting missions, and managing organizational culture, resource development (philanthropy), nonprofit financial management, managing for impact, HR management (volunteering), and cross-sector alliances. (F,SP) The Staff

192N. Topics in Nonprofit Management. (1-5) Course may be repeated for credit as topic varies. One to five hours of lecture per week. Advanced study in the field of nonprofit management that will address current and emerging issues. Topics will vary with each offering. (F,SP) Staff

192P. Strategic Corporate Social Responsibility and Consulting Projects. (3) Three hours of lecture per week. Discuss the strategy of the day through a series of lectures, guest speakers, and projects. The course will address legal, ethical, and practical responsibilities businesses have to society and to each other. The course requires students to develop critical listening skills, improve abilities to deliver authentic and persuasive communication skills, develop critical listening skills, improve abilities to develop and deliver speeches aimed at moving others to action, peer coaching, and lectures, students will sharpen their communication exercises. The course focuses on the fundamentals of public speaking in today’s business environment. Through prepared and impromptu speaking exercises, coaching, and lectures, students will sharpen their authenticity and persuasive communication skills, develop critical listening skills, improve abilities to give, receive, and apply feedback, and gain confidence as public speakers. (F,SP) Staff

193C. Curricular Practical Training for Internationally Certified Students. Internship. Must be taken on a passed/not passed basis. Prerequisites: International Students only. This is a zero-unit internship course for internationally certified students participating in internships under the Curricular Practical Training program. Requires a paper exploring how the theoretical constructs learned in UBGA courses were applied in the internship setting. (F,SP)

195A. Entrepreneurship. (2) Two hours of lecture per week. Formerly Business Administration 195. Principles, theories, and practical aspects of entrepreneurship. Building on functional subject knowledge, explores successes and failures of entrepreneurship. Includes starting new ventures, writing business plans, acquiring other businesses, and making existing enterprises profitable. (F,SP)

195P. Perspectives on Entrepreneurship. (3) Three hours of lecture per week. This course explores and examines key issues facing entrepreneurs and their businesses. It is intended to provide a broad spectrum of topics across many business disciplines including accounting, finance, marketing, organizational behavior, production/quality, technology, etc. Students will acquire a keen understanding of both the theoretical and real world tools used by today’s entrepreneurial business leaders in achieving success in today’s global business environment. (F,SP) Staff

195S. Entrepreneurship To Address Global Poverty. (2) One hour of lecture per week. Students will learn critical skills in assessing how and where entrepreneurial ventures can meaningfully address global poverty vs. more traditional approaches such as foreign aid, private philanthropy or corporate social responsibility initiatives. Combining lectures, case studies, and interviews with social entrepreneurs, it explores poverty and entrepreneurship before focusing on their intersection in various bottom-of-the-pyramid markets, from health, housing, education, and energy to agriculture, and finance. (F,SP) Staff

195T. Topics in Entrepreneurship. (1-3) Course may be repeated for credit as topic varies. One to three hours of lecture per week. Courses of this kind will cover a variety of topics in entrepreneurship related to a specialized interest of type of firm being started (e.g., new ventures in computer software) or in the aspect of the entrepreneurial process being considered (e.g., venture funding). The course typically will be designed to take advantage of the access offered by the University and the locale to knowledgeable and experienced members of the business community. (F,SP) Staff

196. Special Topics in Business Administration. (1-4) One to four hours of lecture per week. Prerequisites: Upper division standing. Formerly Business Administration 196. Study in various fields of business administration. Topics will vary from year to year and will be announced at the beginning of each term. (F,SP) Staff

198. Directed Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of directed study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Business Administration 198. Organized group study on topics selected by upper division students under the sponsorship and direction of a member of the faculty. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Business Administration 199. Enrollment restrictions apply. (F,SP) Staff

200C. Leadership Communication. (1) One hour of lecture and two hours of discussion per week for five weeks. Leadership Communication is a workshop in the fundamentals of public speaking in today’s business environment. Through prepared and impromptu speaking exercises, coaching, and lectures, students will sharpen their authenticity and persuasive communication skills, develop critical listening skills, improve abilities to give, receive, and apply feedback, and gain confidence as public speakers. (F,SP) Staff

200S. Data and Decisions. (2) Four hours of lecture and one and one-half hours of discussion per week for seven weeks. Formerly Business Administration 200S. The objective of this core course is to make students critical consumers of statistical analysis using available software packages. Key concepts include interpretation of regression analysis, model formation and testing, and diagnostic checking. (F,SP) Staff

201A. Economics for Business Decision Making. (4) Four hours of lecture per week for seven weeks. Prerequisites: Knowledge of calculus and algebra assumed. Business success depends on the successful positioning of the firm and the management perceived value of its resources and its ability to think systematically about achieving competitive advantage through the management of the firm’s resources. We will analyze management decisions concerning real options, risk, and exit. We will use readings and cases along with class discussion to develop practical insights into managing for competitive advantage. (F,SP) Staff

201B. Macroeconomics in the Global Economy. (2) Four hours of lecture per week for seven weeks. Prerequisites: 200S, 201A. This course develops and applies macro models of the economy to explain long-run trends and short-run fluctuations in key macroeconomic variables, such as GDP, wage and profit rates, inflation, interest rates, employment and unemployment, budget deficits, exchange rates, and trade balances. (F,SP) Staff

202. Financial Accounting. (2) Four hours of lecture and one and one-half hours of discussion per week for seven weeks. Formerly Business Administration 202A. This course examines accounting measurements for interpreting financial statements. The course is designed for the professional whose financial expertise is not typical of the typical student. The primary purpose of the course is to provide not only a working knowledge but also a clear understanding of the contents of published financial statements. (F,SP) Staff

203. Introduction to Finance. (2) Four hours of lecture per week for seven weeks. Prerequisites: 200S, 202. This is an introductory MBA course in investments. Students learn how to value assets given forecasts of future cash flows and about the risk characteristics of different asset classes. The first part of the course focuses on the time value of money. The second part of the course deals with measuring and pricing risk. Finally, the course touches on derivative basics and capital market efficiency. An effort will be made to tie the theoretical foundations of finance to real-world examples. (F,SP) Staff

204. Operations. (2) Four hours of lecture per week for seven weeks. Prerequisites: 200S. This course provides a broad overview of strategic, operational, and tactical issues facing manufacturing and service companies. Major topics include: strategy formulation; quality management, project management, supply chain management, service-systems management, and operations strategy. These issues are explored through case studies, class discussions, and experiential learning, with students selecting a variety of industries, from fast food to fashion goods to automobiles manufacturing to telephone call centers. (F,SP) Staff

205. Organizational Behavior. (2) Four hours of lecture per week for seven weeks. How can you motivate employees to go above and beyond the call of duty to get the job done? How can you be sure that your decisions are not biased? What influence tactics can you use when you need the formal authority to tell someone what to do? This course adds to your understanding of life in complex organizations by covering topics spanning the micro (individual and team) to the macro (organizational level of analysis), and also topics that integrate these two levels. (F,SP) Staff

205L. Leadership. (1) Three hours of session for seven weeks. The objective of this course is to help students develop an understanding of their own strengths and weaknesses as leaders, and to improve their confidence to envision themselves as, and aspire to be, leaders throughout their careers. The course will include four main components: (1) 360-degree assessment and an accompanying leadership self-assessment analysis; (2) live cases run by leaders in organizations; (3) advanced practices about leadership; and (4) experiential exercises. (F,SP)

206. Marketing Management. (2) Four hours of lecture per week for seven weeks. This course is designed for students interested in understanding the basic concepts and techniques of marketing strategy as a foundation for more advanced study in the area. The course treats marketing from the perspective of both the consumer and the supplier. The course will examine the decisions associated with the management of the marketing function in the modern organization focusing on customer analysis, competitive analysis, and visual level of analysis, the macro (organizational level of analysis), and also topics that integrate these two levels. (F,SP) Staff

207. Ethics and Responsible Business Leadership. (1) Two hours of lecture per week for seven weeks. Formerly Business Administration 207A. This course provides students with the ability to anticipate, critically analyze, and appropriately respond to the social, ethical, and political challenges that face managers operating in a global economy. (F,SP) Staff

Masters in Business Administration

Graduate Courses

200C. Leadership Communication. (1) One hour of lecture and two hours of discussion per week for five weeks. Leadership Communication is a workshop in the fundamentals of public speaking in today’s business environment. Through prepared and impromptu speaking exercises, coaching, and lectures, students will sharpen their authenticity and persuasive communication skills, develop critical listening skills, improve abilities to give, receive, and apply feedback, and gain confidence as public speakers. (F,SP) Staff

200S. Data and Decisions. (2) Four hours of lecture and one and one-half hours of discussion per week for seven weeks. Formerly Business Administration 200S. The objective of this core course is to make students critical consumers of statistical analysis using available software packages. Key concepts include interpretation of regression analysis, model formation and testing, and diagnostic checking. (F,SP) Staff

201A. Economics for Business Decision Making. (4) Four hours of lecture per week for seven weeks. Prerequisites: Knowledge of calculus and algebra assumed. Business success depends on the successful positioning of the firm and the management perceived value of its resources and its ability to think systematically about achieving competitive advantage through the management of the firm’s resources. We will analyze management decisions concerning real options, risk, and exit. We will use readings and cases along with class discussion to develop practical insights into managing for competitive advantage. (F,SP) Staff

201B. Macroeconomics in the Global Economy. (2) Four hours of lecture per week for seven weeks. Prerequisites: 200S, 201A. This course develops and applies macro models of the economy to explain long-run trends and short-run fluctuations in key macroeconomic variables, such as GDP, wage and profit rates, inflation, interest rates, employment and unemployment, budget deficits, exchange rates, and trade balances. (F,SP) Staff

W prefix=online course

Staff
209F. Fundamentals of Business. (3) Three hours of lecture per week. An introduction to business methods of analysis and terminology for nonbusiness graduate students. The course is taught in three five-week modules: (1) organizational behavior and management, (2) accounting and finance, and (3) marketing and strategy. (F,SP) Staff

210. Strategy, Structure, and Incentives. (3) Three hours of lecture per week. Prerequisites: 209A. This course uses tools from economics to derive strategies, tactics, and incentives to achieve the firm’s goals. It develops a framework for analyzing organizational architecture, focusing on the allocation of decision rights, the behavior of managers, and the design of incentives. Includes managing the vertical chain of upstream suppliers and downstream distributors, design and operation of incentive and performance management systems, techniques for dealing with informational asymmetries. (F,SP)

211. Game Theory. (3) Three hours of lecture per week. A survey of the main ideas and techniques of game-theoretic analysis related to bargaining, conflict, and negotiation. Emphasizes the identification and analysis of archetypal strategic situations in bargaining. Goals of the course are to provide a foundation for applying game-theoretic analysis, both formally and intuitively, to negotiation and bargaining; to recognize and analyze strategic situations in complicated negotiation settings; and to feel comfortable in the process of negotiation. (F,SP) Staff

212. Energy and Environmental Markets. (3) Three hours of lecture per week. Prerequisites: Business Administration 231 or equivalent. Formerly Business Administration 212. Business strategy and public issues in energy and environmental markets. Topics include development and effect of organized spot, futures, and derivative energy markets; political economy of regulation and deregulation; climate change and environmental policies related to energy production and use; cartels, market power and competition policy; pricing of exhaustible resources; competitiveness of alternative energy sources; and transportation and storage of energy commodities. (F,SP)

215. Business Strategies for Emerging Markets: Management, Investment, and Opportunities. (3) Three hours of lecture per week. This course helps students to study the institutions of emerging markets that are relevant for managers, analyze opportunities presented by emerging markets, analyze the additional ethical challenges and issues of social responsibility common in emerging markets, and learn to minimize the risks in doing business in emerging markets. This course is a combination of lectures, class participation, and cases. (F,SP)

217. Topics in Economic Analysis and Policy. (S-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study of the field of economic analysis and policy. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

218A. International Finance. (3) Three hours of lecture per week. Prerequisites: Business Administration 212. Formerly Business Administration 201A. This course introduces students to the institutions and operation of the international macroeconomic environment; special attention is paid to international financial arrangements relevant for managers of multinational corporations. Topics include foreign exchange and capital markets; the balance of payments; open economy macroeconomics; exchange rate determination; history of international financial institutions; international financial institutions and practices used in multinational financial system; arbitrage and hedging; international aspects of financial decisions. (F,SP)

222. Financial Information Analysis. (3) Three hours of lecture per week. Prerequisites: Business Administration 202A or consent of instructor. Formerly Business Administration 222. Issues in corporate financial information evaluation with special emphasis on the use of financial statements by decision makers external to the firm. The implications of recent research in finance and accounting for external reporting issues will be explored. Emphasis will be placed on models that describe the user’s decision context. (F,SP)

223. Corporate Financial Reporting. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Business Administration 202A or consent of instructor. Formerly Business Administration 231. This course examines the theory and practice of financial accounting and the issues involved in determining corporate financial reporting policies. It provides an understanding of the decisions managers are prepared but emphasizes the evaluation of accounting reports from a managerial perspective. Cases supplement lecture, discussion, and problem solving. (F,SP)

224A. Managerial Accounting. (3) Three hours of lecture and one hour of optional discussion per week for 10 weeks. Prerequisites: Business Administration 202A or equivalent. Formerly Business Administration 224. This course emphasizes the use of accounting information throughout the planning, operation and control stages of managing an organization. The course is divided into three sections to reflect these three stages of management: (1) information for planning and decision making; (2) information received during operations (cost accounting); and (3) information for control and performance evaluation. (SP)

227B. Topics in Taxation. (3) Course may be repeated for credit. Three hours of lecture per week. Formerly Business Administration 227B. This course will cover various topics in personal or corporate taxation or both. Topics will vary from semester to semester. (F,SP)

231. Corporate Finance. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: Business Administration 230. Formerly Business Administration 234. This course will study the principles underlying alternative financial arrangements and contracts and their application to corporate financial management. The course examines the impact of incentive, moral hazard, and principal-agent problems, that arise as a consequence of asymmetric information, government intervention, management, and asset structure. Financial decisions regarding capital budgeting, dividend policy, capital structure and mergers. (F,SP)

232. Financial Institutions and Markets. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: Business Administration 203. Formerly Business Administration 232. This course will analyze the role of financial markets and financial institutions in allocating capital. The major focus will be on debt contracts and securities and on innovations in the markets for government securities. The functions of commercial banks, investment banks, and other financial intermediaries will be covered, and aspects of the regulation of these institutions will be examined. (F,SP)

233. Investments. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: Business Administration 203. Formerly Business Administration 233. This course will examine four different types of asset markets: (1) equity markets, (2) fixed income markets, (3) futures markets, and (4) options markets. It will focus on the valuation of assets in these markets, the empirical evidence on asset valuation models, and strategies that can be employed to achieve various investment goals. (F,SP)

235. Advanced Topics in Financial Institutions and Financial Markets. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Business Administration 232. Formerly Business Administration 235. Formerly Business Administration 236. Advanced study of financial institutions, management of financial institutions, the analysis of money and capital markets, and empirical studies on financial institutions and financial markets. Topics to be covered will vary. (F,SP) Staff

236A. Futures and Option Markets. (2) Course may be repeated for credit. Two hours of lecture per week. Formerly Business Administration 236A. The design, pricing and management of financial futures and options. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

240. Risk Management via Optimization and Simulation. (1) Two hours of lecture per week for eight weeks. Prerequisites: 200S, 203, and 204, or con-
246A. Service Strategy. (3) Three hours of lecture per week. Prerequisites: Business Administration 204 or equivalent. Formerly Business Administration 252A. This course considers two techniques for guiding a managerial decision maker who has to make a choice now but will only know later whether the choice was good. Decision analysis helps firms make decisions of the choice dilemma: “nature”; game models help if the outcome depends on human opponents (e.g., competitors). Foundations of the two techniques, and a variety of applications, are studied.

248A. Supply Chain Management. (3) Three hours of lecture per week. Prerequisites: 204 or Evening & Weekend Master of Business Administration 204 or consent of instructor. This course is designed to teach general management principles involved in the planning, execution, and management of service business. It covers both strategic and tactical aspects, including the development of a strategic service vision, building employee loyalty, developing customer loyalty and satisfaction, and evaluative feedback, leading a virtual team, marketing and selling, ethical implications, and leadership. Students will develop skills necessary to plan and implement an effective service strategy.

251. Human Resources Management. (3) Three hours of lecture per week. Prerequisites: Business Administration 205 or consent of instructor. Formerly Business Administration 251A. This course focuses on the role of human resources in organizations. It addresses topics relating to the management of human resources, including management development and training, employee management, inventory management, supplier-buyer coordination, selection, evaluation, motivation, and development.

252. Negotiations and Conflict Resolution. (2,3) Two to three hours of lecture per week. Prerequisites: Business Administration 206 or equivalent. Formerly Business Administration 252A. This course focuses on understanding the true distribution of power in organizations, identifying strategies for building sources of power, developing strategies for influencing others, and the role of power in building cooperation and leading change in organizations, and making sense of others’ attempts to influence them. These skills are essential for effective and satisfying career development as well as building and maintaining long-term relationships.

256. Global Management Skills. (3) Three hours of lecture per week. Prerequisites: Business Administration 205 or equivalent. Formerly Business Administration 256A. The focus of this course is cross-cultural studies of management organizations. (2) Identify strategies for building sources of power, (3) develop strategies for influencing others, and (4) understand the role of power in building cooperation and leading change in organizations, and make sense of others’ attempts to influence them. These skills are essential for effective and satisfying career development as well as building and maintaining long-term relationships.

257. Special Topics in Organizational Behavior and Industrial Relations. (2-3) Course may be repeated for credit. Three to six hours of lecture per week. Prerequisites: Business Administration 205 or consent of instructor. Formerly Business Administration 257A. Analysis of recent literature and developments in industrial relations, employment, labor-management relations, human resource management, and labor standards. The primary focus is on maximizing sales force productivity. Topics covered include the selling process, organizational structures and sales force design, compensation, evaluation, motivation, and deployment.

261. Marketing Research: Tools and Techniques for Data Collection and Analysis. (3) Three hours of lecture per week. Prerequisites: Business Administration 206 or equivalent. Formerly Business Administration 261A. This course develops the skills necessary to plan and implement an effective market research study. Topics include research design, psychological measurement, survey methods, experimentation, statistical analysis of marketing data, and effective reporting of technical material to management. Students select a client and prepare a market research study for the course. Course intended for students with substantive interests in marketing.

262. Strategic Brand Management. (3) Three hours of lecture per week. Prerequisites: Business Administration 202B or equivalent. Formerly Business Administration 262A. This course focuses on understanding the true distribution of power in organizations, identifying strategies for building sources of power, developing strategies for influencing others, and the role of power in building cooperation and leading change in organizations, and making sense of others’ attempts to influence them. These skills are essential for effective and satisfying career development as well as building and maintaining long-term relationships.

263. Information-and Technology-Based Market- ing. (3) Three hours of lecture per week. Prerequisites: Business Administration 206 or equivalent. Formerly Business Administration 263A. Information technology has allowed firms to gather and process large quantities of information about consumers’ choices and reactions to marketing campaigns. However, few firms have the expertise to intelligently act on such information. This course addresses this shortcoming by teaching students how to use customer information to better market to consumers. In addition, the course examines how information technology affects marketing strategy.

264. High Technology Marketing Management. (3) Three hours of lecture per week. Prerequisites: Business Administration 206 or equivalent. Formerly Business Administration 264A. High technology refers to a wide range of products and services that have occurred at a technological change at a pace significantly faster than for most goods in the economy. Under such circumstances, the marketing task faced by the high technology firm differs in some ways from the usual. The purpose of this course is to explore these differences.

265. Integrated Marketing Communications. (2,3) Two to three hours of lecture per week. Prerequisites: Business Administration 202B or equivalent. Formerly Business Administration 265A. A specialized course in advertising, focusing on management and decision making. Topics include objective-setting, copy decisions, media decisions, budgeting, and examination of theories, models, and consumer research methods appropriate to these areas. Other topics include social/economic issues of advertising by nonprofit organizations.

266. Channels of Distribution. (2) Two hours of lecture per week. Prerequisites: Business Administration 202B or equivalent. Formerly Business Administration 266A. The focus of this course is to examine the examination of distribution channels. The marketing program often weighs heavily upon its co-execution by members of the firm’s distribution channel. This course seeks to provide an understanding of how the strategic and tactical roles of these channels can be identified and managed. This is accomplished, through studying the broad economic and social forces which govern the channel evolution. It is completed through the examination of tools to select, manage, and motivate channel partners.

268A. Global Marketing Strategy. (2) Two hours of lecture per week. Prerequisites: Business Administration 206 or equivalent. Formerly Business Administration 268A. Global marketing strategy is a strategy in which one firm markets its products throughout the world. The course will cover a wide variety of strategies relating to the management of international marketing strategy, including frameworks for developing international marketing strategy; sources and sustainability of competitive advantage; international market structure analysis appropriate to these categories, and integration of marketing strategy with other functional strategies.

268B. International Marketing. (3) Three hours of lecture per week. Prerequisites: Business Administration 202B or equivalent. Formerly Business Administration 268B. This course will cover a wide variety of strategies relating to the management of international marketing strategy, including frameworks for developing international marketing strategy; sources and sustainability of competitive advantage; international market structure analysis appropriate to these categories, and integration of marketing strategy with other functional strategies.
269. Pricing. (3) Three hours of lecture per week. This three-module course aims to equip students with proven concepts, techniques, and frameworks for assessing competition and pricing strategies. The first module develops the economics and behavioral foundations of pricing. The second module discusses several innovative pricing concepts including price customization, dynamic pricing, product line pricing, and behavior towards Internet-based, buyer-determined pricing models. (F,SP) Staff

270. Business and Public Policy. (2) Three hours of lecture for 10 weeks. Formerly Business Administration 207B. Introduces the economy, government in a mixed economy, business-government relations, the public policy process, regulation of business, corporate political activity and corporate governance. Prepares students to the innovation process and its management. It includes the full chain of innovative activities beginning with R&D and extend- ing to specialized real estate financing circumstances and real estate evaluation. (SP)

282. Real Estate Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Business Administration 284. Analysis of selected problems and special studies; cases in residential and non-residential development and financing, urban redevelopment, real estate taxation, mortgage market developments, equity investment, valuation, and zoning. (SP)

285. Real Estate Investments. (3) Three hours of lecture per week. The course covers the financial and economic concepts in real estate investment. It begins with pro forma investment analysis. We then value development sites across the main sectors: residential, commercial, and industrial. We also cover contracting with public and private sector partners and related steps. Finally, we study loan and equity structures (REITs), the secondary mortgage market, real estate in investment portfolios. (F,SP) Staff

272. Corporate Environmental Strategy and Management. (2) Two hours of lecture per week. Overview of critical developments in corporate environmental strategy and management. Preparing students to think about strategic business opportunities present in the need to conserve resources and solve environmental problems. Topics include market and nonmarket drivers of corporate environmental strategies, management tools and system design technologies and concepts; and techniques for translating environmental factors into effective business strategies. (F,SP) Staff

275. Business Law: Managers and the Legal Environment. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A manager must understand the legal environments which impact business and understand how to work effectively with lawyers. This course addresses the main business relationships and agreements. Topics covered include forms of business organization, duties of officers and directors, intellectual property, antitrust, contracts, employment law, environmental law, and debtor-creditor relationships including bankruptcy. (F,SP) Staff

276. Media and Entertainment: Economics, Strategy, and Policy. (3) Three hours of lecture per week. An introduction to the economics of media and entertainment industries. Examines economic tools to understand some of the peculiarities of business that impact the nature of contracting, and the organization of firms and markets. Based on an understanding of the business, the course will provide an overview of public policy issues and explore diverse strategic responses. (F,SP) Staff

277. Special Topics in Business and Public Policy. (1-3) One to three hours of lecture per week. Prerequisites: Business Administration 207 or equivalent, or consent of instructor. Formerly Business Administration 278. Topics vary by semester at discretion of instructor and by student demand. Topical areas include: business and professional ethics and the role of corporate social responsibility in the mixed economy; managing the external affairs of the corporation, including community, government, media and stakeholder relations; technology policy, research and development and the effects of government regulation of business on technological innovation and adoption. (F,SP)

280. Real Estate Investment and Market Analysis. (3) Three hours of lecture and one hour of optional discussion per week. Prerequisites: Consent of instructor. Formerly Business Administration 280. A review of literature in the theory of land use, urban growth, and real estate market behavior; property rights and valuation; residential and nonresidential markets; construction; credit; equity financing; public controls and policies. (F,SP)

282. Real Estate Development. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Business Administration 282. The interaction of the private and public sectors in urban United States corporate management; models of the urban economy; growth and decline of urban areas; selected policy issues—housing, transportation, financing, local government, urban redevelopment, and neighborhood change—are examined. (F)

283. Real Estate Finance and Securitization. (3) Three hours of lecture and one hour of optional discussion per week. Formerly Business Administration 280 and background in the basics of finance, micro-economics, macro-economics, statistics, and quantitative analysis. Formerly Business Administration 283. This course provides the fundamentals of real estate financial analysis, including elements of mortgage financing and taxation. The course will apply the standard tools of financial analysis to specialized real estate financing circumstances and real estate evaluation. (SP)

284. Real Estate Investment Strategy. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Business Administration 284. Analysis of selected problems and special studies; cases in residential and non-residential development and financing, urban redevelopment, real estate taxation, mortgage market developments, equity investment, valuation, and zoning. (SP)

285. Real Estate Investments. (3) Three hours of lecture per week. The course covers the financial and economic concepts in real estate investment. It begins with pro forma investment analysis. We then value development sites across the main sectors: residential, commercial, and industrial. We also cover contracting with public and private sector partners and related steps. Finally, we study loan and equity structures (REITs), the secondary mortgage market, real estate in investment portfolios. (F,SP) Staff

286. Housing and the Urban Economy. (3) Three hours of seminar per week. Prerequisites: Public Policy 210A-210B or equivalent. Formerly Business Administration C296. This course considers the economics of urban housing and land markets from the view-points of investors, developers, public and private managers, and consumers. It considers the interactions between private action and public regulation— including land use policy, taxation, and government subsidy programs. We will also analyze the links between primary and secondary mortgage mar- kets, securitization, and liquidity. Finally, the links between local housing and related markets—such as transportation and public finance—will be explored. (F) Quigley

287. Special Topics in Real Estate Economics and Finance. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: Business Administration 280 and consent of instructor. Formerly Business Administration 278. Topics vary each semester. Topic areas include advanced techniques for real estate financial analysis and valuation; the securitization of real estate debt instruments; real estate and Planning; the role of the Bureaucratic organization; the behavior of real estate markets; portfolio theory; and real estate asset allocation. (F,SP)

290A. Introduction to Management of Technology. (3) Three hours of lecture per week. Formerly Business Administration 290E. This course gives students an overview of the main topics encompassed by man- agement of technology. It includes the full chain of innovative activities beginning with R&D and extending through production and marketing. Why do many start-ups fail? What are the critical success factors at each stage of innovation? What are the success factors at each stage of innovation? The course introduces students to Kauffman and College of Engineering faculty working in the relevant areas and student projects at leading high tech firms. (F,SP) Staff

290B. Biotechnology Industry Perspectives and Business Development. (2) Two hours of lecture per week. This course is designed to examine the strategic issues that confront the management of the development-stage biotech company, i.e., after its startup via an initial capital infusion, but before it might be deemed successful (e.g., by virtue of a product launch), or otherwise has achieved “first-tier” status. It reviews the major structures of the biotechnology industry, during the process of its growth and maturation from an early-stage existence through “adolescence” into an “adult” company. (F,SP) Staff

290C. Strategic Computing and Communications Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, business administration, information systems, or consent of instructor. Formerly Business Administration C290D. Students critically impact the success of new computing and communications products and services (based on emerging technologies such as electronics and software) in commercial applications. Technology trends and limits, economics, standardization, intellectual property, government policies and industrial organization. Strategies to manage the design and marketing of successful products and services. (SP) Messerschmitt, Varian

290D. Design as Strategic Management Issue. (2) Two hours of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration 290K. This course is a study of product design, facilities design, and corporate identity design. It will cover how these design strategies are integral to product development and influence customer satisfaction, quality issues, manufacturing procedures, and marketing tactics. (F,SP)

290E. Marketing for High-Tech Entrepreneurs. (3) Three hours of lecture per week. Every successful entrepreneurial high tech venture has at its core individual and collective capabilities and management expertise and 2) technological skill. This course is intended to provide the marketing skills needed for the management of an entrepreneurial high technology venture, regardless of whether the new technology is techno-material. We examine in depth successful marketing approaches for entrepreneurial companies as a function of markets and technologies. Emphasis is placed on the special requirements for creating and executing marketing plans and programs in a setting of rapid technological change and limited resources. This course is particularly suited for those who anticipate starting or operating technology companies. (F,SP) Staff

290G. International Trade and Competition in High Technology. (2) Two hours of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration 290K. This course prepares students to find a startup business in China or to work with an MNC in China, developing novel business strategies and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guani to aid future business development in China. (F,SP) Staff

290H. Managing Innovation and Change. (3) Three hours of lecture per week. Formerly Business Administration 274. This course is designed to introduce students to the innovation process and its management. It provides an overview of technological change and links it to specific strategic choices. Identifies the diverse elements of the innovation process and how they are managed; discusses the uneasy relationship between technology and the workforce; and examines the critical analysis and strategic decision tools needed for the management of an entrepreneurial high-technology venture, regardless of whether the new technology is techno-material. (F,SP) Staff

290I. Innovation in Services and Business Models. (2) Two hours of lecture per week. This course prepares students to find a startup business in China or to work with an MNC in China, developing novel business strategies and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guani to aid future business development in China. (F,SP) Staff

290J. Managing Innovation and Change. (3) Three hours of lecture per week. This course prepares students to found a startup business in China or to work with an MNC in China, developing novel business strategies and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guani to aid future business development in China. (F,SP) Staff

290K. Innovation in Services and Business Models. (2) Two hours of lecture per week. This course prepares students to find a startup business in China or to work with an MNC in China, developing novel business strategies and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guani to aid future business development in China. (F,SP) Staff

290L. Managing Innovation and Change. (3) Three hours of lecture per week. This course prepares students to find a startup business in China or to work with an MNC in China, developing novel business strategies and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guani to aid future business development in China. (F,SP) Staff

158 / Business Administration
290N. Managing the New Product Development Process. (3) Three hours of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration 290L. An operationally focused course that aims to develop the interdisciplinary skills required for successful product development. Through readings, case studies, guest speakers, applied projects, and group discussions, students discover the basic tools, methods, and organizational structures used in new product development management. Course covers process phases: idea generation, product definition, product development, testing and refinement, manufacturing ramp-up, and product launch. (F,SP)

290P. Project Management Case Studies. (2) Two hours of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration 290L. This course presents case studies of projects that required intervention to avert catastrophic failure. Students will discuss case studies and review real management problems of major corporations. They will create strategic plans to alleviate problems and learn how to manage a large project to a successful completion. (F,SP)

290T. Topics in Management of Technology. (5-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of management of technology. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

290V. Innovation in Telecommunications and New Media. (3) Three hours of lecture per week. Prerequisites: Business Administration 240, Formerly 244D. This course introduces students to the industry to gain better understanding of one of the most important issues facing today’s management—designing, implementing, and managing telecommunication and distributed computer systems. The topics are centered on the development of networking technologies: the selection, design, and management of telecommunication systems; strategies for distributed data processing; office automation; and management of personnel and organizations. (F,SP)

290W. Wireless Communications. (3) Three hours of lecture per week. This course focuses on current issues facing the global wireless communications industry. Particularly emphasized is planning in the industry structure, value chain, and business models of various players and investigating opportunities for startups and new entrants. Explores the role of regulation, technological innovation, and competition in shaping the future of the industry. Drawn on various disciplines such as public policy, law, economics, finance, marketing, engineering, and physics. (F,SP) Staff

291A. Speaking as a Leader. (2) One hour of lecture and two hours of discussion per week. Formerly Business Administration 291A. Leaders need more than the capacity of inspiring commitment in their constituencies rather than merely demanding compliance. This course will teach future leaders the elements that are essential for such change. The instructor solicits students' personal convictions, then provides a structure and method for effectively communicating these beliefs. Participants will develop confidence in both the content of their message and their ability to convey it. (F,SP)

291D. Data Visualization for Discovery and Communication. (1) Eight hours of lecture for two weeks. This course exposes the problems of poor data presentation and introduces design practices necessary to create effective business and scientific communication. Clear, efficient, and powerful. This course identifies what to look for in the data and describes the types of graphs and visual analysis techniques most effective for communicating business information in a meaningful sense of it. (F,SP)

291T. Topics in Managerial Communications. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Formerly Business Administration 291T. This course will provide the student with specific strategies for effective written communication in some area of managerial communications. Topics include multimedia business presentations, personal leadership development, diversity management, and making meetings work. Topics will vary from semester to semester. (F,SP)

292A. Strategic Management of Nonprofit Organizations. (2,3) Two to three hours of lecture per week. This course prepares students, conceptually and practically to create, lead, and manage nonprofit organizations. Focuses on the centrality of the mission, governing board leadership, application of strategy and strategic management, issues unique to or characteristic of the sector: performance measurement, program development, financial management, resource development, community relations, and resource management, advocacy, and management. (F,SP) Staff

292B. Nonprofit Boards. (1) Eight hours of lecture for two weeks. The purpose of this class is to acquaint Master of Business Administration students, many of whom will be asked to serve on nonprofit boards throughout their careers, with the nonprofit sector and the roles and responsibilities of nonprofit boards. Students will learn why nonprofit boards exist, how they are structured, how they differ from corporate boards, what their legal responsibilities are, how boards and chief executives relate to each other, and how boards contribute to the effectiveness of nonprofit organizations. (F,SP)

292C. Strategic CSR and Consulting Projects. (3) Three hours—292C1 and 292C2. Formerly 292D. Focuses on the field strategic of CSR through a series of lectures, guest speakers, and projects. It will examine best practices used by companies to engage in socially responsible practices. It will provide students with a flavor of the complex dilemmas one can face in business in trying to do both "good for society" and "well for shareholders." It looks at CSR from a corporate strategic perspective and how it supports core business objectives, core competencies, and bottom-line profits. (F,SP) Staff

292F. Financial Management of Nonprofit Organizations. (1) Eight hours of lecture for two weeks. Prerequisites: 203, financial experience, or equivalent. The course focuses on financial management issues faced by board members and senior and executive managers in nonprofit organizations. Students learn tools and techniques for effective planning and budgeting, cash management, program evaluation, and fund raising. Use and development of internal and external financial reports are studied with an emphasis on using financial information in decision making. Tools and techniques of financial statement analysis, interpretation, and presentation are practiced. (F,SP)

292N. Topics in Nonprofit and Public Management. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Formerly 292M. Advanced study in the field of nonprofit and public management. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

292R. Nonprofit Marketing and Fundraising. (2) Two hours of lecture per week. Thorough overview of fundraising principles as well as experience in all the major fundraising tools mail, telemarketing, direct mail, online, major gifts, planned giving, capital campaigns, proposal writing, and corporate giving. The course further distinguishes what is different about fundraising and marketing, and how they work as a subset of a larger marketing plan. Students learn how to brand an organization, make it more visible and turn it into a consultation team that works with a select non-profit client to help them succeed in an entrepreneurial venture. A partnership with a professional management consulting firm, McKinsey & Company, the course includes experienced McKinsey consultants coaching each of the student teams. (F,SP)

292T. Topics in Socially Responsible Business. (2-3) Course may be repeated for credit. One-half to three hours of lecture per week. Course will study in the field of socially responsible business. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

293. Individually Supervised Study for Graduate Students. Course may be repeated for credit. Prerequisites: Graduate standing. Formerly Business Administration 293. Individually supervised study of subjects not available to the student in the regular curriculum, approved by faculty advisor as appropriate for the student's program. (F,SP)

293C. Curricular Practical Training Internship. Course may be repeated. The course will be individually supervised and must be approved by the faculty advisor. Must be taken on a satisfactory/unsatisfactory basis. This is an independent study course for international students doing internships under the Curricular Practical Training Program. Requires a paper exploring how the theoretical constructs learned in MBA courses were applied during the internship. (F,SP) Staff

294. Selected Topics for MBA Students. (1) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: All core courses or equivalents. Formerly Business Administration 295A. This course is about how to start a new business and how people in the business plan review teams are organized in teams of four around new venture ideas of their own choosing. They conduct research, consult with members of the business community, perform analysis, and write a formal business plan. The course presents an appeal for funding to a panel consisting of the instructors and members of the investing community. (F,SP)

295B. Venture Capital and Private Equity. (3) Three hours of lecture per week. Prerequisites: 295A and 295B. Formerly Business Administration 295B. This course is intended to provide the background, tools, and themes of the venture capital industry. The course is organized in four modules of the private equity cycle: (1) fund raising—examining how private equity funds are structured and started; (2) investments considers the interactions between private equity investors and the entrepreneurs that they finance; (3) exit—examines the process through which private equity investors exit their investments; and (4) new frontiers—reviews many of the key ideas developed in the course. (F,SP) Staff

295C. Opportunity Recognition: Technology and Entrepreneurship in Silicon Valley. (3) Three hours of lecture per week. Prerequisites: 295A, 295B. Formerly Business Administration 295C. This course is intended to provide the core skills needed for the identification of opportunities that can lead to successful, entrepreneurial high technology ventures, regardless of the individual's "home" skill set, whether technical or managerial. We examine in depth the approaches most likely to succeed for entrepreneurial companies as a function of markets and technologies. Emphasis placed on the special requirements for creating and implementing strategy in a rapidly changing technological environment and limited resources. This course is particularly suited for those who anticipate founding or operating technology companies. (F,SP) Staff

295D. New Venture Finance. (2) Three hours of lecture per week. Prerequisites: Business Administration 295A or consent of instructor. Formerly Business Administration 295D. This is a course about financing new entrepreneurial ventures, emphasizing those that have the possibility of creating a national or international impact. This is an intensive course for selected students who anticipate starting their own businesses or working with entrepreneurs to develop new companies. It is intended for those who have the possibility of creating a national or international impact. This is an intensive course for selected students who anticipate starting their own businesses or working with entrepreneurs to develop new companies. It is intended for those who have the possibility of creating a national or international impact.
be graded on a letter-grade basis. Sections 11-15 to
295T. Special Topics in Entrepreneurship. (1-3)
Staff
founding, financing, and operating a life science com-
in an emerging life science-based company. Students
which founders and early venture managers normally

295G. Investing in Entrepreneurial Opportunities: Building
of the entrepreneurial challenges is a key com-

397C. Health Care Technology Policy. (2)

397B. Health Care Finance. (2)

397A. Healthcare in the 21st Century. (3)

397. Public Policy in the Business of Health Care. (2)

298A-298B. International Business Development for

2989. Seminar in International Business. (2,3) Four
to five and one-half hours of fieldwork per week for
eight weeks. This course involves a series of speaker
workshops and seminar-type classes in preparation for a

399H. Competitive and Corporate Strategy. (2,3) Three
hours of lecture per week. Prerequisites: All core
courses. Formerly Business Administration 299B.
Examines optimal production and pricing policies for
firms in competitive environments; optimal strategies
through time; strategies in the presence of imperfect
information. How differing market structures and gov-
ernments in the global environment. Special attention
to the challenges of developing and implementing
global new product development strategies when indus-
trial policy and global governance. (F,SP)

399K. Global Strategy and Multinational Enterprise. (2,
3) Two to three hours of lecture per week. Prereq-
quisites: All core courses. Formerly Business Adminis-
tration 299E. Identifies the management challenges
facing international firms. Attention to business strate-
gies, organizational structures, and the role of gov-

399J. Advanced study defined and budgeting, man-
gagement and policy issues that drive reform efforts.

399I. Strategic Management and the Organization
sions by competitive firms also explored. (F,SP)

399H. Advanced study in strategic management of health services organiza-
tional performance. Empha-
sive positioning in product markets; decisions about
management control, debt and equity financing, risk and
capital budgeting, and project risk assessment.

399F. Customer and Business Development in Hi-
tec-Enterpise. (2) Two hours of lecture per week.
This course is about how to successfully organize
sales, marketing, and business development in a
startup. For the purpose of this course, a "startup"
can either be a new venture, or an existing com-
pany entering a new market. Both must solve a
common set of issues: Where is our market? Who
are our customers? How do we build the right team?
How do we scale sales? These issues are at the heart
of the "customer development" process covered in
this course. (F,SP) Staff

399. Strategy. (2) Four hours of lecture per week for
seven weeks. Prerequisites: 201A. Course covers
core topics in strategy, including selection of goals;
the choice of products and services; affect outcomes
favorable or unfa-
stive opportunities and challenges of operating in a
specific country or region. Evaluation is based on student
presentations, participation, and a research paper.
(F,SP) Staff

298X. MBA Exchange Program. (1-15) Course may
be repeated for credit. One to 15 hours of fieldwork per
week for ten weeks. Prerequisites: All core courses.
Formerly Business Administration 299D. Strategic
planning theory and methods with an emphasis on cus-
tomer, competitor, industry, and environmental analysis
and its application to strategy development and choice.
(F,SP) Staff

2987. Public Health 223A or equivalent. The purpose of
this course is to provide students with a framework for
analyzing policy problems, a working knowledge of the
public process, and an ability to discuss, analyze and
provide important policy topics facing the
health care system. (F,SP) Staff

297E. Public Policy in the Business of Health Care. (2)
Two hours of lecture per week. Prerequisites: Public
Health 223A or equivalent. The purpose of this

course is intended to broaden students’ perspective and knowledge about the
legal system/process so that they are prepared to:
(1) identify, analyze, and deal with legal issues,
(2) understand the need to legal and policy

grounds for laws and regulations, and (3) work effec-
tively and efficiently with inside and outside legal coun-
sel to resolve legal problems and manage legal risk.
(F,SP) Staff

295L. Entrepreneurship Workshop for Start-ups. (2)
Two hours of lecture per week. This workshop is
intended for students who have their own experimen-
tal venture project under development. The business
concept may be in the startup mode, or further along
in its evolution. The pedagogy is one of "guided"
entrepreneurship where students, working in groups,
undertake the real challenges of building a
venture. Students must be willing to discuss their
project with others in the workflow as group discus-
sion of the entrepreneurial challenges is a key com-
ponent of the class. (F,SP) Staff

295K. Customer and Business Development in Hi-
tech Enterprise. (2) Two hours of lecture per week.
This course is about how to successfully organize
sales, marketing, and business development in a
startup. For the purpose of this course, a "startup"
can either be a new venture, or an existing com-
pany entering a new market. Both must solve a
common set of issues: Where is our market? Who
are our customers? How do we build the right team?
How do we scale sales? These issues are at the heart
of the "customer development" process covered in
this course. (F,SP) Staff

295J. Advanced study in strategic management of health services organiza-
tions. It systematically addresses system-wide, orga-
nization-wide, group-level, and individual-level issues in
strategy formulation, content, implementation, and
performance. It considers internal and external fac-
tors that affect organizational performance. Empha-
sis is on the development and implementation of
strategies to meet stakeholders’ demands, and total
quality management approaches. This course covers
a wide variety of health care organizations including
providers, plans, systems, suppliers, pharmaceuti-
cals, and biotechs. The course builds on 205 and
Public Health 223A. (F,SP)

299M. Marketing Strategy. (3) Three hours of lecture per week.
Prerequisites: All core courses. Formerly Business
Administration 299M. Strategic planning theory and
methods with an emphasis on customer, competitor,
industry, and environmental analysis and its
application to strategy development and choice.
(F,SP) Staff

299L. Entrepreneurship Workshop for Start-ups. (2)
Two hours of lecture per week. This workshop is
intended for students who have their own experimen-
tal venture project under development. The business
concept may be in the startup mode, or further along
in its evolution. The pedagogy is one of “guided"
entrepreneurship where students, working in teams,
undertake the real challenges of building a
venture. Students must be willing to discuss their
project with others in the workflow as group discus-
sion of the entrepreneurial challenges is a key com-
ponent of the class. (F,SP) Staff

295J. Entrepreneurship in Biotechnology. (2) Two
hours of lecture per week. An introduction to the com-
plexities and unique problems of entrepreneurship in
the biotechnology industry in terms of both entrepre-
eurs and students who may some day found or work
in an emerging life science-based company. Students
are exposed to the topics most critical to successfully
founding, financing, and operating a life science com-
pany and are expected to perform many of the tasks
which founders and early venture managers normally
undertake. (F,SP) Staff

295T. Special Topics in Entrepreneurship. (1-3)
One to three hours of lecture per week. Sections 11-15
to be graded on a satisfactory/unsatisfactory basis. Pre-

requisites: All core courses or equivalents. Formerly
Business Administration 295C. This course will
cover issues in entrepreneurship that either appeal to
a specialized interest by type of firm being started
(e.g., new ventures in computer software) or in the
aspect of the entrepreneurial process being consid-
ero, new venture funding). The courses typically
will require students to access resources offered by the
University and the locale to knowledgeable and
experienced members of the business community. (F,SP)

296. Special Topics in Business Administration. (.5-3)
Course may be repeated for credit. One-half to
two hours to be taken on a satisfactory/unsatisfactory
basis.

Prerequisites: Successful completion of all core
courses; good academic standing. Students who par-
ticipate in one of the Haas School of Business’s
domestic or international exchange programs receive
credit (usually 12 units) at Haas for the set of courses
that they successfully complete at their host school.
The courses that the students take at the host school
are subject to review by the MBA Program office to
ensure that they match course requirements at Haas.
(F,SP) Staff

295. Case Studies in Entrepreneurship. (2) Two
hours of lecture per week. This course integrates the
learnings from summer entrepreneurships into acad-
emic experience. Class will include development of
an analysis of cases based on the internship, and
opportunities to meet with management of the host
programs. By the end of the semester, students will
better understand how to take it runs to an entrepre-
neural enterprise. (F,SP) Staff
200C. Leadership Communications. (1) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Leadership communication is a workshop in the fundamentals of public speaking in today’s business environment. Through prepared and impromptu speeches aimed at moving others to action, peer coaching, and lectures, students will sharpen their authentic and persuasive communication skills, develop critical listening skills, improve abilities to give, receive, and apply feedback, and gain confidence as public speakers. (F,SP) Staff

210A. Economics for Business Decision Making. (2) Three hours of lecture per week for nine weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: E204. Formerly Business Administration E201A. This course uses the tools and concepts of microeconomics to analyze decision problems within a business firm. Particular emphasis is placed on the firm’s choice of policies in determining prices, inputs usage, and outputs. The effects of the state of the competitive environment on business policies are also examined.

210B. Macroeconomics in the Global Economy. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Business Administration E201A. This course builds on the foundations developed in E201A to develop theories of fiscal policy, monetary policy, and other macro-economic policies. Both the issues in and the connections between these policies will be examined. Other topics covered in the course range from the specifics of the U.S. balance of payments situation to the broader problems associated with economic growth and decay in the world.

204. Operations. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Admission to the program. Formerly Business Administration E204. An introduction to the application of quantitative methods to management decision problems. Topics include linear programming, probability theory, decision analysis, regression and correlation, and time series analysis.

205. Organizational Behavior. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Admission to the program. Formerly Business Administration E205. A survey of knowledge about behavior in and of organizations. Covered will be issues of individual behavior, group functioning, and the actions of organizations in their environments. Problems of work motivation, task design, leadership, communication, organizational design, and innovation will be analyzed from multiple theoretical perspectives. Implications for the management of organizations will be illustrated through examples, cases, and exercises.

205L. Leadership. (1) Three hours of lecture for seven weeks. The objective of this course is to help students develop an understanding of their own strengths and weaknesses as leaders, and their contributions to or challenges for their organizations. Emphasis will be placed on knowledge of behavior as an aspirational leader, and aspirational leaders throughout their careers. The course will include four main components: (1) 360-degree assessment and an accompanying leadership self-assessment; (2) case studies of leaders in organizations; (3) advanced practices about leadership; and (4) experiential exercises. (F,SP)

206. Marketing Organization and Management. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Business Administration E200. Formerly Business Administration E206. Topics include an overview of the marketing system and the marketing control process, research, segmentation and marketing decision making, marketing structures, and evaluation of marketing performance in the economy and society. (F,SP) Staff

207. Ethics and Responsibility in Business. (1) Four hours of lecture per week for four weeks or three hours of lecture per week for five weeks. Prerequisites: Admission to the program. Formerly Business Administration E207. A study of basic ideas, concepts, attitudes, rules, and institutions in our society which either support or challenge ethical behavior in work within which the system operates. (F,SP) Staff

211. Modeling and Neural Networks. (3) Three hours of evening lecture per week. Formerly Business Administration E211A. This course will cover various topics in artificial neural networks, including feed-forward and recurrent networks. Emphasis will be placed on supervised and unsupervised learning algorithms.

213. Probability and Statistics. (4) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Business Administration E203. Formerly Business Administration E213. This course will examine the wide menu of available assets, the institutional structure of U.S. and international financial markets, and the institutional mechanisms for trading securities. Topics include discounting, capital budgeting, historical behavior of asset returns, and diversification and portfolio theory. Course will also provide introductions to asset pricing theory for primary and derivative assets and to the principles governing corporate financial arrangements and contracting. (F,SP) Staff

214. Investments. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for nine weeks. Prerequisites: Business Administration E214. Formerly Business Administration E214. An introduction to the main models and theories that have been used to explain the behavior of key economic variables, such as consumption, investment, and output. (F,SP) Staff

215. Business Strategies for Emerging Markets: Management, Investment, and Opportunities. (3) Three hours of lecture per week. This course helps students to study the institutions of emerging markets that are relevant for marketers, analyze opportunities presented by emerging markets, analyze the additional ethical challenges and issues of social responsibility common in emerging markets, and learn to minimize the risks in doing business in emerging markets. This course is a combination of lectures, class participation, and cases. (F,SP)

217. Topics in Economic Analysis and Policy. (0.5-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of economic analysis and policy. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

218. International Finance. (3) Three hours of lecture per week. Prerequisites: Business Administration E218. Formerly Business Administration E218. This course introduces students to the institutions and operation of the international macroeconomic environment; special attention is paid to international financial arrangements relevant for managers of multinational corporations. Topics include foreign exchange and capital markets; the balance of payments; open economy macroeconomics; exchange rate determination; history of the international financial system; arbitrage and hedging; international aspects of financial decisions. (F,SP)

222. Financial Information Analysis. (3) Three hours of lecture per week. Formerly Business Administration E222. Issues of accounting information evaluation with special emphasis on the use of financial statements by decision makers outside the firm. The implications of recent research in finance and accounting for external reporting issues will be explored. Emphasis will be placed on models that describe the user’s decision context. (SP)

223. Corporate Financial Reporting. (3) Three hours of evening lecture per week. Prerequisites: Business Administration E203B and E203 or equivalent. Formerly Business Administration E220. Intensive study of the principles of financial statement analysis and accounting for financial reporting. Topics include asset and liability measurement, income determination, financial reporting.

224A. Managerial Accounting. (2) Six hours of evening lecture per week for five weeks. Prerequisites: E204. Formerly Business Administration E220B. Management is dependent on an information system that provides dependable, timely, and relevant information to all decision makers. The goal of this course is to identify the information needs of managers and to introduce the methods and systems that accountants can provide the necessary data through appropriate budget, cost, and other information systems.

227B. Topics in Taxation. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Business Administration E227B. Formerly Business Administration E227. Formerly Business Administration E227B. This course will cover various topics in personal or corporate taxation or both. Topics will vary from semester to semester. (F,SP) Staff

231. Corporate Financial Management. (3) Three hours of evening lecture per week. Prerequisites: Business Administration E230. Formerly Business Administration E234. Financial policies of firms including asset acquisition and replacement, capital structure, dividends, working capital, and mergers. Development of theory and application to financial management decisions. (F,SP)
238. Financial Institutions and Markets. (3) Three hours of lecture per week. Prerequisites: Business Administration E203 or E204. Staff

239. Behavioral Finance. (1-3) Five to 14 hours of lecture per week. Prerequisites: 203. This course looks at the influence of decision heuristics and biases on investor welfare, financial markets, and corporate decisions. Topics include overconfidence, attribution theory, reference point, probability, anchoring and adjustment, prospect theory, “Winner’s Curse,” speculative bubbles, IPOS, market efficiency, limits of arbitrage, relative mis-pricing of common stocks, the tendency to trade in a higher half, stock fashion, investor welfare, and market anomalies. (F,SP) Staff

240. Designing Financial Models that Work. (1) Two hours of lecture per week for eight weeks. Fourteen hours of lecture per week for four weeks. Prerequisites: 203 or consent of instructor. Staff

241. International Management. (3) Three hours of lecture per week. Prerequisites: Business Administration E232. Formerly Business Administration E233. Staff

242. Advanced Study in the Field of Organizational Behavior. (1) Two to three hours of lecture per week. This course is designed to complement the technical and diagnostic skills learned in other courses in the MBA program. (F,SP) Staff

243. Topics in Finance. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of finance. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

244. Risk Management via Optimization and Simulation. (1) Seven hours of lecture for two weeks. Prerequisites: 202 and 204, or consent of instructor. Staff

245. Introduction to Advanced Study in Finance. (3) Formerly Business Administration E262A. Staff

246. Investment Strategies and Styles. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Business Administration E203 plus one additional graduate finance course. Formerly Business Administration E265. Staff

247. Topics in Manufacturing and Operations. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of manufacturing and operations. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

248. Supply Chain Management. (3) Three hours of lecture per week. Prerequisites: 204 or Master of Business Administration 204 or consent of instructor. Staff

249. Information Technology Strategy. (3) Three hours of lecture per week. Staff

250. Negotiations and Conflict Resolution. (2.3) Two to three hours of lecture per week. This course will provide students with a sense of “political intelligence.” After taking this course, students should be able to: (1) diagnose the true distribution of power in organizations, (2) identify strategy for building sources of power, (3) develop techniques for influencing others, (4) understand the role of power in building cooperation and leading change in organizations, and (5) make sense of others’ attempts to influence them. These skills are essential for effective and satisfying career building. (F,SP) Staff

251. Human Resources Management. (3) One three-hour evening lecture per week. Prerequisites: Business Administration E206 or equivalent. Formerly Business Administration E262. Staff

252. Strategic Brand Management. (3) Three hours of lecture per week. Prerequisites: Business Administration E206. Formerly Business Administration E262A. The focus of this course is on developing student skills to formulate and critique complete market- ing programs including product, price, distribution, and promotion policies. Case analyses are heavily used. The course is designed primarily for students who will take a limited number of advanced marketing courses and wish an integrated approach. (F,SP) Staff

253. Consumer Insights. (3) Three hours of lecture per week. Prerequisites: Business Administration E206 or equivalent. Formerly Business Administration E259. Staff

254. Power and Politics in Organizations. (2.3) Two to three hours of lecture per week. This course will provide students with a sense of “political intelligence.” After taking this course, students should be able to: (1) diagnose the true distribution of power in organizations, (2) identify strategy for building sources of power, (3) develop techniques for influencing others, (4) understand the role of power in building cooperation and leading change in organizations, and (5) make sense of others’ attempts to influence them. These skills are essential for effective and satisfying career building. (F,SP) Staff

255. Global Management Skills. (3) Three hours of lecture per week. Prerequisites: 205. This course is about flexible organizational designs and adaptive leadership strategies in global markets. It will be of special interest to students working in high tech, life sciences and biotechnology, telecommunications, management consulting, and financial services. Topics include new trends in global organizational design, leading geographically dispersed teams, establishing credibility, building relationships, obtaining information, evaluating people, giving and receiving feedback, leading a virtual team, marketing and selling, transferring knowledge, and managing change. Skill areas covered include leadership and growth mindset competencies, such as resilience, interpersonal adaptability, and other skills which are especially important in Asia, EMEA, and the Americas, with numerous examples from leading global companies. (F,SP) Staff

256. Global Management Skills. (3) Three hours of lecture per week. Staff

257. Topics in Organizational Behavior and Industrial Relations. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Staff

258. International Business: Designing Global Organizations. (3) Three hours of lecture per week. Staff
263. Information- and Technology-Based Marketing. (3) Three hours of lecture per week. Prerequisites: Business Administration E206. Formerly Business Administration E263. Information technology has allowed firms to gather and process large quantities of information about consumers’ choices and reactions to marketing campaigns. However, few firms have the capability to intelligently act on such information. This course addresses this shortcoming by teaching students how to use customer information to better market to consumers. In addition, the course addresses how information technology affects marketing strategy. (F,SP) Staff

264. High Technology Marketing Management. (3) Three hours of lecture per week. Prerequisites: Business Administration E206 or equivalent. Formerly Business Administration E264. High technology refers to innovations and services which are subject to technological change at a pace significantly faster than for most goods in the economy. Under such circumstances, the marketing task faced by the high technology firm differs in some ways from the usual. The purpose of this course is to explore these differences. (SP) Staff

265. Integrated Marketing Communications. (2,3) Two to three hours of lecture per week. Prerequisites: 260 or equivalent. Formerly Business Administration E265. This course in advertising focuses on management and decision making. Topics include objective-setting, copy decisions, media decisions, budgeting, and examination of theories, models, and other tools appropriate to these decision areas. Other topics include social/economic issues of advertising by nonprofit organizations. (F,SP) Staff

266. Channels of Distribution. (3) Three hours of lecture per week. Formerly Business Administration E266. The success of any marketing program often weights on the selection and execution of the channel. This course will cover the principles of sales force and advertising. (F,SP) Staff

266A. Sales Force Management. (1) Eight hours of lecture for two weeks. The sales force is a key (and not inexpensive) component of a firm’s overall marketing strategy. This class will provide students with a toolbox for handling a variety of sales-force-related issues—both strategic and tactical. The primary focus is on maximizing sales force productivity. Topics covered include the selling process, organizational structure, sales force sizing, territory design, compensation, evaluation, motivation, and deployment. (F,SP) Staff

267. Topics in Marketing. (5-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of marketing. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

268. International Marketing. (3) Three hours of lecture per week. Provides frameworks, knowledge, and sensitivities to formulate and implement marketing strategies for competing in the international arena. Regions and countries covered include the Americas, Europe, Asia, Africa, and the Asia-Pacific. Issues covered include global versus local advertising, international pricing strategies, selecting and managing strategic international alliances and distribution channels, managing international brands and product lines through product life cycle, international retailing, and international marketing organization and control. (F,SP) Staff

269. Pricing. (3) Three hours of lecture per week. This three-module course aims to equip students with practical pricing tools and frameworks, and to develop their skills in assessing and formulating pricing strategies. The first module develops the economic and behavioral foundations of pricing. The second module discusses several pricing tools and frameworks. The third module builds on the first two and introduces concepts including price customization, nonlinear pricing, price matching, and product line pricing. The third module analyzes the strengths and weaknesses of several Internet-based, buyer-centered pricing models. (F,SP) Staff

275. Business Law: Managers and the Legal Environment. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Course covers the legal environment. Topics covered include federal and state regulations; the rights and responsibilities of managers; credit relationships and business agreements. Topics include forms of business organization, duties of officers and directors, intellectual property, antitrust, contracts, employment, and the management of creditor relationships including bankruptcy. (F,SP) Staff

277. Special Topics in Business and Public Policy. (1-3) One to three hours of lecture per week. Prerequisites: Business Administration E207 or equivalent, or consent of instructor. Formerly Business Administration E277. Topics vary by semester at discretion of instructor and by student demand. Topical areas include business and professional ethics and the role of corporate social responsibility in the mixed economy; managing the external affairs of the corporation, including community, government, media and stakeholder relations; technology policy, research and development, and the effects of government regulation of business; international technological innovation and adoption. (F,SP) Staff

280. Real Estate Investment and Market Analysis. (3) Three hours of lecture per week. Formerly Business Administration E280. Intensive review of literature in the theory of land utilization, urban growth and real estate market, property rights, property rights valuation; residential and non-residential markets; construction, debt and equity financing; public controls and policies. (F,SP) Staff

282. Real Estate Development. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Business Administration 282. The interaction of the private and public sectors in urban development; market analysis; growth and decline of urban areas; and selected policy issues—housing, transportation, financing, local government, urban redevelopment, and neighborhood change—are examined. (F) Staff

283. Real Estate Finance and Securitization. (3) Three hours of lecture per week. Prerequisites: Business Administration E280; and background in the basics of finance, micro-economics, macro-economics, statistics, and quantitative analysis. Formerly Business Administration E283. This course will introduce students to the fundamentals of real estate financial analysis, including elements of mortgage financing and taxation. The course will apply the standard tools of financial analysis to real estate investment, financing circumstances and real estate evaluation. (F,SP) Staff

284. Real Estate Investment Strategy. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Business Administration E284. Analysis of selected problems and special studies; case in real estate analysis and non-residential development and financing, urban redevelopment, real estate taxation, mortgage market developments, equity investment, valuation, and zoning. (F,SP) Staff

287. Special Topics in Real Estate Economics and Finance. (1-3) Course may be repeated for credit. One hour of lecture per week per unit. Prerequisites: Business Administration E280 and consent of instructor. Formerly Business Administration E281. Topics vary each semester. Topic areas include advanced techniques for long-term economic and structuring and evaluation; the securitization of real estate debt and equity; issues in international real estate; cyclical behavior of real estate markets; portfolio theory, performance evaluation, and decision making. (F,SP) Staff

290L. Project Management Case Studies. (2) Two hours of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration 290L. This course presents case studies of projects that required intervention to avert catastrophic failure. Students will discuss case studies and review real management problems of major corporations. They will create strategic plans to alleviate problems and learn how to manage a large project to a successful conclusion. (F,SP) Staff

290T. Topics in Management of Technology. (5-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of management of technology. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

291C. Active Communicating. (1) Eight hours of lecture for two weeks. This course develops the basic building blocks of impactful communication—e.g., concentration, energy, voice, physical expressiveness, and the ability to draw an audience in. Students will be drawing upon expertise from theater arts. Active, participatory exercises allow for the development and embodiment of effective communication skills. Class meets two full days and includes participants’ specific workplace applications. (F,SP) Staff

291D. Data Visualization for Discovery and Communication. (1) Eight hours of lecture for two weeks. This course exposes the problems of poor data presentation and introduces design practices necessary to communicate quantitative business information clearly, efficiently, and powerfully. This course identifies what to look for in the data and describes the types of graphs and visual analysis techniques most meaningful and making sense of it. (F,SP) Staff

291T. Topics In Managerial Communications. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Formerly Business Administration 291T. This course will provide the student with specialized knowledge in some area of managerial communications. Topics include multimedia business presentations, personal leadership development, diversity management, and meetings work. Topics will vary from semester to semester. (F,SP) Staff

292A. Strategic Management of Nonprofit Organizations. (2,3) Two to three hours of lecture per week. This course prepares students conceptually and practically to create, lead, and manage nonprofit organizations. Focuses on the centrality of the mission, governing board leadership, application of strategy and strategic planning, and strategic management of issues unique to or characteristic of the sector: performance measurement, program development, financial management, community connections, and accountability. (F) Staff

292B. Nonprofit Boards. (1) Eight hours of lecture for two weeks. The purpose of this class is to acquaint students with nonprofit organizations. Focuses on the centrality of the mission, governing board leadership, application of strategy and strategic planning, and strategic management of issues unique to or characteristic of the sector: performance measurement, program development, financial management, community connections, and accountability. (F,SP) Staff

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
292C. Strategic CSR and Consulting Projects. (1-3) One to three hours of lecture per week. Discuss the field of strategic CSR through a series of lectures, guest speakers, and projects. This course will examine best practices among companies to engage in socially responsible practices. It will provide students with a flavor of the complex dilemmas one can face in business in trying to do both ‘good for society’ and ‘well for shareholders.’” (F,SP) Staff

292F. Financial Management of Nonprofit Organizations. (1) Eight hours of lecture for two weeks. Prerequisites: 203, financial experience, or equivalent. The course focuses on financial management issues faced by board members and senior and executive managers in nonprofit organizations. Students learn tools and techniques for effective planning and budgeting and how to control, evaluate and revise plans. Use and development of internal and external financial reports are studied with an emphasis on using financial information in decision making. Tools and techniques of financial statement analysis, interpretation, and presentation are practiced. (F,SP) Staff

292N. Topics in Nonprofit and Public Management. (1-3) One to three hours of lecture per week. Formerly Evening Workshop in Management E292M. Advanced study in the field of nonprofit and public management. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

292R. Nonprofit Marketing and Fundraising. (2) Two hours of lecture per week. Prerequisites: E210. The course includes an assignment of fundraising principles as well as experience in all the major fundraising strategies: direct mail, online, major gifts, planned giving, capital campaigns, proposal writing, and events. The course further describes what is different about fundraising and marketing and looks at how fundraising is a subset of a larger marketing plan. Students learn how to brand an organization, make it more visible, and turn marketing strategies into fundraising opportunities. (F,SP) Staff

292S. Social Sector Solutions: Nonprofit Consulting Projects. (3) Three and one-half hours of lecture per week. The purpose of this course is to develop students’ understanding of the problems of the social sector and the professional skills necessary to solve them. The course includes an assignment to a consulting team that works with a select nonprofit client to help them succeed in an entrepreneurial venture. A partnership with a professional management consulting firm, McKinsey & Company, the course includes experienced McKinsey consultants coaching each of the student teams. (F,SP)

292T. Topics in Socially Responsible Business. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of socially responsible business. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

293. Individually Supervised Study for Graduate Students. (1-5) Course may be repeated for credit. One to five hours of independent study per week. (F,SP) Staff

293C. Curricular Practical Training Internship. Course may be repeated. Must be taken on a satisfactory/unsatisfactory basis. This is an independent study course for international students under the Curricular Practical Training Program. Requires a paper exploring how the theoretical constructs learned in MBA courses were applied during the internship. (F,SP) Gent

295A. Entrepreneurship. (3) Three hours of evening lecture per week. Prerequisites: Business Administration E295. The development of creative marketing strategies for new ventures, as well as the resolution of specific marketing problems in smaller companies which provide insight into some of the unique characteristics of small business. Prerequisites: two years of college English and two years of college mathematics. (F,SP) Staff

295B. Venture Capital and Private Equity. (3) Three hours of lecture per week. Prerequisites: 295A and 234 recommended. This is an advanced course-based course intended to provide the background, tools, and themes of the venture capital industry. The course is organized in four modules of the private equity cycle: (1) fund raising—examines how private equity funds are raised and structured; (2) investing—considers the interactions between private equity investors and the entrepreneurs that they finance; (3) exiting—examines the process through which private equity investors exit their investments; and (4) new frontiers—reviews many of the key ideas developed in the course. (F,SP) Staff

295D. New Venture Finance. (2) Two hours of lecture per week. Prerequisites: 295A and 234 recommended. This is an advanced course-based course intended to raise student's awareness about financing new entrepreneurial ventures, emphasizing those that have the possibility of creating a national or international impact or both. It will take two perspectives—the entrepreneur’s and the investor’s—and place a special focus on the venture capital process, including how they are formed and managed, accessing the public markets, mergers, and strategic alliances. (F,SP) Staff

295E. Case Studies in Entrepreneurship. (2) Two hours of lecture per week. This course integrates the theories of entrepreneurship into academic experience. Cases will include development of an analysis of cases based on the internship, and opportunities to meet with management of the host companies. By the end of the semester, students will better understand what it takes to run an entrepreneurial venture. (F,SP) Staff

295F. Customer and Business Development in Hi-Tech Enterprise. (2) Two hours of lecture per week. This course is about how to successfully organize sales, marketing, and business development in a startup. For the purpose of this course, a “startup” can either be a new venture, or an existing company entering a new market. Both must solve a common set of issues: Where is our market? Who are our customers? How do we build the right team? How do we scale sales? These issues are at the heart of the “customer development” process covered in this course. (F,SP) Staff

295G. Investing in Entrepreneurial Opportunities: Building an Investment Screen, Methodology, and Process. (2) Two hours of lecture per week. This course will provide students with an education in to the complexities and unique problems of entrepreneurship in companies with great growth potential but that are facing significant challenges to achieving that potential. This class is designed to provide students with the tools and skills most critical to successfully screen and evaluate companies that have both a great set future growth opportunities and a great set of current problems. This class will use case studies, practical valuation and other exercises, and the energy, enthusiasm, and intellectual capacity of its students to create a great learning environment. (F,SP) Staff

295P. Entrepreneurship Workshop for Startups. (2) Two hours of lecture per week. This workshop is intended for students who have their own experimental venture project under development. The business concept may be in the startup mode or further along in its evolution. The pedagogy is one of guided entrepreneurship where students, often working in teams, are guided to undertake a venture. Students must be willing to discuss their projects with others in the workshop, as group deliberation of the entrepreneurial challenges is a key component of the course. (F,SP) Staff

295T. Topics in Entrepreneurship. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of entrepreneurship. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

296. Special Topics in Business Administration. (1-3) Course may be repeated for credit. One-half credit represents one hour of lecture per week. Prerequisites: Graduate standing. Formerly Business Administration E296. Advanced study in various fields of business. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

298S. Seminar in International Business. (2,3) Four to five and one-half hours of fieldwork per week for eight weeks. This course involves a series of speaker and seminar-type classes in strategy, including a two-week study tour of a specific country or region. Participants will visit companies and organizations and meet with top-level management to learn about the local business structure, administrative systems, and specific country or region. Evaluation is based on student presentations, participation, and a research paper. (F,SP) Staff

298X. EWBMA Exchange Program. (1-15) Course may be repeated for credit. One to 15 hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Successful completion of all core courses: good academic standing. Students who participate in one of the Haas School of Business’ domestic or international exchange programs receive credit (usually 12 units) at Haas for the set of courses that they successfully complete at their host school. The courses that the students take at the host school are subject to review by the EWBMA Program office to ensure that they match course requirements at Haas. (F,SP) Staff

299. Strategy. (2) Four hours of lecture per week for seven weeks or three and one-half hours of lecture per week for eight weeks. Prerequisites: 201A. Course covers core topics in strategy, including selection of goals; the choice of products and services to offer; competitive positioning in product markets; decisions about scope and diversity; and the design of organizational structure, administrative systems, and issues of control and internal regulation. (SP) La Blanc

299B. Global Strategy and Multinational Enterprise. (2,3) Two to three hours of lecture per week. Prerequisites: All core courses. Formerly Business Administration E226. Identifies the major challenges facing international firms. Attention to business strategies, organizational structures, and the role of governments in the global environment. Special attention to the challenges of developing and implementing global new product development strategies when industrial structures and government policies differ. Efficacy of joint ventures and strategic alliances. Implications for industrial policy and global governance. (F,SP) Staff

299E. Competitive Strategy. (2,3) Three hours of lecture per week. Prerequisites: Business Administration E201A, E201B, E204. Formerly Business Administration E210. Examines optimal production and pricing policies for firms in competitive environments; optimal strategies under time; and strategies in the presence of imperfect information. How differing market structures and government policies (including taxation) affect output and pricing decisions. Strategic planning decisions of firms by competitive firms also explored. (F,SP) Staff

299M. Marketing Strategy. (3) Three hours of evening seminar per week. Prerequisites: Business Administration E202B, E203, E205, E206. Formerly Business Administration E207. Strategic planning theory and methods with an emphasis on customer, competitor, industry and environmental analysis and its application to strategy development and choice. (F,SP)
Executive Masters in Business Administration

200G. Decision Models. (1) Five hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This core course introduces students to quantitative concepts, techniques, and software tools charged with making successful managers familiar. The objective of this course is to improve decision making by introducing managers to optimization techniques, simulation, and project management. (F,SP) Staff

200S. Data Analysis for Management. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Formerly Business Administration 200S. The objective of this core course is to make students critical consumers of statistical analysis using available software packages. Key concepts include interpretation of regression analysis, model formation and testing, and diagnostic checking. (F,SP) Staff

201A. Managerial Economics. (2) Three hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This course uses the tools of microeconomics to analyze decision problems within a business firm. Particular emphasis is placed on the firm’s choice of policies in determining prices, inputs, usage, and output. The effectiveness of competitive enterprises is evaluated with basic economic models. (F,SP) Staff

201B. Global Economic Environment. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This core course addresses the determination of economic concepts and financial practices at work in the global economic environment. Topics include long-run productivity and growth, short-run economic fluctuations in both closed and open economies, exchange rate and foreign debt decisions, and the nature of payment systems. (F,SP) Staff

203. Finance. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This core course examines the wide menu of available financial instruments within the national structure of U.S. and international financial markets, and the market mechanisms for trading securities. Topics include discount, capital budgeting, historical behavior of asset returns, and the management of investment and portfolio choices. This course will also provide introductions to asset pricing theory for primary and derivative assets and to the principles governing corporate financial arrangements and contracting. (F,SP) Staff

204. Operations Management. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This core course provides students with an understanding of the processes and technology involved in managing a manufacturing-based business and introduces them to the tools that are available to deal with these issues. Students will also learn pertinent fundamental concepts in management science that are applicable to other functional areas. (F,SP) Staff

205. Creating Effective Organizations. (2) Three hours of lecture per week. Ten hours of lecture per week. Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 200S. This core course surveys knowledge about behavior of organizations and in organizations. The course will include study of the issues of organizational structure, group functioning, and the actions of organizations in their environments, and analysis from a number of theoretical perspectives of such problems as work motivation, task design, leadership, communication, organizational design, and innovation. The class will explore the implications of these management functions through examples, cases, and exercises. (F,SP) Staff

206. Marketing Organization and Management. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 201A or equivalent. This core course provides an overview of the marketing system and the marketing concept, buyer behavior, market research, segmentation, marketing decision making, marketing structures, and evaluation of performance of marketing in the economy and society. (F,SP) Staff

209. Competitive and Corporate Strategy. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 201A or equivalent. This is a core course designed to introduce managers to the processes involved in industry and market analysis; the development of a business strategy, competitive positioning, planning, and the implementation of an integrated business program. Students will consider competing strategies as companies aim to achieve their own goals and objectives, often at the expense of their rivals, from the personal and professional manager’s perspective. Emphasis is charged with overall responsibility for a company’s performance in a variety of competitive and corporate contexts. (F,SP) Staff

233. Investments. (2) Three hours of lecture per week. Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This course will examine four different types of asset markets: (1) equity markets, (2) fixed income markets, (3) futures markets, and (4) options markets. It will cover the fundamental valuation and analysis of assets, the empirical evidence on asset valuation models, and strategies that can be employed to achieve various investment goals. (F,SP) Staff

236E. Mergers and Acquisitions. (2) Three hours of lecture per week. Ten hours of lecture for three weeks. This course is designed to introduce students to the process of mergers and the process of acquisitions. Techniques used in mergers and acquisitions are covered. Course work includes reading, lectures, and discussion of case material and simulations of real negotiations. A key focus of this course is the role of third parties in resolving disputes. (F,SP) Staff

252. Managerial Negotiations. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 205. This core course provides students with an understanding of the processes and technology involved in managing a manufacturing-based business and introduces them to the tools that are available to deal with these issues. Students will also learn pertinent fundamental concepts in management science that are applicable to other functional areas. (F,SP) Staff

264. High Technology Marketing. (2) Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 206 or equivalent. High technology refers to that class of products and services which is subject to technological change at a pace significantly faster than for most goods in the economy. Under such circumstances, the marketing task faced by the high technology firm differs in some ways from the usual. The purpose of this advanced elective course is to explore these differences. (F,SP) Staff

275. Business Law: Managers and the Legal Environment. (2) Ten hours of lecture for three weeks. Prerequisites: Completion of all core courses or consent of instructor. A manager must understand the legal environments which impact business and understand how to work effectively with lawyers. This course covers the legal aspects of business relationships and business agreements. Topics covered include forms of business organization, duties of officers and directors, intellectual property, antitrust, contracts, employment relationships, corporate law, and creditor relationships including bankruptcy. (F,SP) Staff

285. Real Estate Investments. (2) Ten hours of lecture for three weeks. Prerequisites: Completion of all core courses or consent of instructor. This course covers the key financial and economic concepts in real estate investment. It begins with pro forma investment analysis. We then value development sites across the main sectors: residential, retail, office, industrial, and hotel. We also cover contracting with both public and private sectors. Finally, we study loan and equity structures (REITs), the secondary mortgage market, real estate in investment portfolios. (F,SP) Staff

293. Individual Supervised Study for Graduate Students. (1-6) Course topic varies. One to four hours of independent study per week. Prerequisites: Consent of supervising faculty. Individually supervised study of subjects not available to the student in the regular schedule, approved by faculty adviser as appropriate for the student’s program. (F,SP) Staff

295A. Entrepreneurship and Innovation. (2) Two hours of lecture per week. Ten hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. This course focuses on proactive and creative marketing strategies for new ventures, as well as the resolution of specific marketing problems in smaller companies which provide innovative goods and services. Emphasis is placed on decision making under conditions of weak data, inadequate resources, emerging markets, and rapidly changing environments. (F,SP) Staff

295D. New Venture Finance. (2) Three hours of lecture for three weeks. This is a course about financing the entrepreneur. Principal themes include identifying those that have the possibility of creating a national or international impact or both. It will take two perspectives—the entrepreneur’s and the investor’s—and it will cover the financial and management aspects of entrepreneurial process, including how they are formed and managed, accessing the public markets, mergers, and strategic alliances. (F,SP) Staff

295F. Customer and Business Development in High-Tech Enterprise. (2) Three hours of lecture for three weeks. This course is designed to successfully organize sales, marketing, and business development in a startup. For the purpose of this course, a “startup” can either be a new venture, or an existing one entering a new market. Both must solve a common set of issues: Where is our market? Who are our customers? How do we build the right team? How do we scale sales? These issues are at the heart of this course. (F,SP) Staff

295T. Special Topics in Entrepreneurship. (1-3) One to three hours of lecture per week. Prerequisites: All core courses or equivalents. Advanced study in the field of entrepreneurship. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP) Staff

296. Special Topics in Business Administration. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Advanced study in various fields of business administration. Topics will vary from
230A. Fundamentals of Financial Economics. (2) Four hours of lecture per week for eight weeks. Formerly Business Administration 230A. The course discusses the theoretical economics of asset pricing, with the standard discounted cash flow analysis, and generalizes this approach to develop the No Arbitrage Pricing Technique for security valuation. Topics will be fixed income securities, derivative securities, contingent claims, basic principles of option portfolio theory, models of equilibrium asset pricing, including CAPM and related Factor Models. (F,SP)

230B. Advanced Corporate Finance. (2) Three to four hours of lecture per week for eight weeks. Formerly Business Administration 230B. This course teaches students to apply a business valuation framework to solve financial problems. Issues related to corporate governance and agency problems are also addressed. (F,SP)

230C. Derivatives: Economic Concepts. (2) Four hours of lecture per week for seven and one-half weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230C. The course is an introduction to the use and pricing of derivatives. It covers mathematical concepts and numerical methods underlying derivative analysis, the institutional structure of derivative markets, valuation of standard options, and the binomial and Black-Scholes option pricing models and volatility estimation. Programming, modeling, and analysis of derivatives will be covered in depth. (F,SP)

230D. Derivatives: Quantitative Methods. (2) Four hours of lecture per week for eight weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230D. This course emphasizes the pricing of derivatives in continuous time, from the formulation of the pricing problem to the implementation of computational and numerical solution techniques. (F,SP)

230E. Empirical Methods in Finance. (2) Six hours of lecture per week for eight weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230E. This course reviews probability and statistical techniques commonly used in quantitative finance. It includes a review of normal, lognormal, CEV distribution, estimation and nonparametric techniques commonly used in finance (MLE, GMM, GARCH). Students will be introduced to financial databases and application software to estimate volatilities and correlations and their stability. (F,SP)

230F. The Design of Securities for Corporate Financing. (1) Two hours of lecture per week for eight weeks. Prerequisites: 230D. The view of corporate finance presented in this course stems from an analysis of two related issues: (1) how firms create value and (2) how corporate finance facilitates the process of value creation. As part of this process, we will examine the factors that help determine financial strategy, thereby putting the design of financial packages in perspective. In particular, the course focuses on how corporate financing needs lead to the need for financial engineering and spur financial innovation. (F,SP)

230G. Equity and Currency Markets. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230G. This course reviews various equity markets and their relative importance. It provides models of and historical evidence on the average returns and volatility of returns on equities, on the trade-to-trade equity price behavior, on option pricing and other primary financial risks. Determination of stock and forward rates and volatility, volume, high frequency dynamics and dealer behavior are examined. (F,SP)

230H. Financial Risk Measurement and Management. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230H. This course examines risk measurement and management including market risk, credit risk, liquidity risk, operational risk, and other types of financial risks. Topics will include risk management techniques for different types of contracts and portfolios such as duration, portfolio beta, factor sensitivities, stress testing, emerging markets, and extreme value analysis, and other risk management techniques. (F,SP)

230I. Fixed Income Markets. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: 230D. Formerly Business Administration 230I. This course provides a quantitative approach to fixed income securities and bond portfolio management. Topics include fixed income securities, pricing and uses for portfolio management or for hedging interest rate risk, the pricing of default-sensitive fixed and floating rate instruments, and immunization techniques, the modern theory of bond pricing, and derivative instruments. (F,SP)

230J. Success and Failure in Financial Innovation. (2) Two to four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230I-230B. Formerly Business Administration 230J. Students will participate in a series of case studies designed to illustrate the basic failure modes of modern financial innovation. They will learn how to measure success and failure and discuss case studies in portfolio insurance, long-term capital management, mortgage-back securitization, and corporation enterprise-wide risk control. (F,SP)

230K. Dynamic Asset Management. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230A-230B. Formerly Business Administration 230K. This course reviews portfolio theory and pricing models. It includes risk models for international portfolio returns; models of optimal allocation of funds; exchange rate uncertainty and criteria for judging the performance of managers and models of different types of applications; different types of applications; and strategies to achieve various investment objectives. (F,SP)

230L. Real Options and Commodity Derivatives. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230C-230D, and 230K. Formerly Business Administration 230L. This course covers real option theory. Topics include the “convenience yield” in commodity futures prices, the value of pure growth firms (firms with no current earnings) in the optimal timing of a fixed investment or liquidate, and valuing and optimally undertaking staged investment decisions. The theoretical asset pricing models that use an option based approach and characteristics of and methods and commodity derivatives will also be covered. (F,SP)

230M. Asset-Backed Security Markets. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: Business Administration 230D and 230L. Formerly Business Administration 230M. This course extends the study of fixed income securities to advanced topics on mortgage and other asset-backed securities. Topics will include basic mechanisms of structuring deals for mortgage-related securities, credit cards, leases, and other debt markets and the risk management techniques involved in originating and valuing these assets. The valuation of pooled assets and derivative bonds using Monte Carlo and option pricing techniques, and trading strategies are also evaluated. (F,SP)

230N. Applied Finance Project. (1-3) Individually arranged. Prerequisites: Approval of the supervising faculty. Formerly Business Administration 230N-230P. Students will be required to complete an applied finance project that explores a quantitative finance problem that might be met in practice and involves the development or use of quantitative financial techniques. (F,SP)

230Q. Introduction to Stochastic Calculus. (2) Four hours of lecture per week for eight weeks. Formerly Business Administration 230Q. This course introduces the students to techniques from stochastic analysis employed in mathematical finance. Topics include stochastic processes, Brownian motion, integral, differential, and Ito's formula; martingales. (F,SP)

230R. Advanced Computational Finance. (2) Four to five hours of lecture per week for six and one-half weeks. Prerequisites: Business Administration 230Q-230P. Formerly Business Administration 230P. This course builds on the techniques learned in 230Q. Quantitative Methods for Derivative Pricing. The focus is to gain a deeper analysis of numerical and computational issues in pricing and calibration. The orientation of the course is hands-on, with heavy use of computational techniques applied to case projects. The primary objective of this course is to prepare students to tackle the latest challenges in quantitative pricing that they are likely to encounter in the finance industry. (F,SP)

230S. Behavioral Finance. (2) Two to four hours of lecture per week for eight weeks. Prerequisites: 230D. Formerly Business Administration 230S. Behavioral decision theory has greatly contributed to our understanding of financial markets. This course discusses the common biases and heuristics identified by psychologists. Topics include over-confidence, the attribution theory, the representative heuristic, the availability heuristic, anchoring and adjustment, fairness, and prospect theory. We will try to gain an understanding of how these biases affect managers, investors, and financial markets. (F,SP)

230T. Topics in Financial Engineering. (1-5) Course may be repeated for credit as topic varies. Two to ten hours of lecture per week for eight weeks. Formerly Business Administration 230T. This course addresses current and emerging issues. Topics will vary with each offering and will be announced at the beginning of each term. (F,SP)

230V. Credit Risk Modeling. (2) Four hours of lecture per week for eight weeks. Formerly Business Administration 230V. Credit risk modeling and conceptual overview of current techniques. Covers default probabilities, loss given default, correlation, credit portfolio analytics, bond valuation, loan valuation, and credit derivative valuation. Emphasis will be placed on fundamental valuation, model validation, and interpreting model output. Students will be required to do some high-level programming in a package such as MATLAB. Some empirical testing exercises will also be given. (F,SP)

230A. International Business. (2) Fifteen hours of lecture for three weeks. Section 1 to be graded on a satisfactory/unsatisfactory basis. Section 2 to be graded on a letter-grade basis. Prerequisites: 298A. This required course entails an experimental study of an international business topic undertaken during a one-week field study session abroad. The course includes a combination of lectures and site visits. (F,SP)
used in practice will benefit from taking this course. (F,SP) Staff

230VB. Credit Risk: Quantitative Modeling. (1) Three hours of lecture for six weeks. Focuses on the techni-ques currently used to model credit risk. The course will cover default probabilities, loss given default, cor-relation, credit portfolio analytics, bond valuation, loan valuation, and credit derivative valuation. Emphasis will be placed on model building, model validation, and model output. Students will be required to do some high-level programming in a package such as MATLAB. Some empirical testing exer-cises will also be part of the project work. (F,SP) Staff

293. Individually Supervised Study for Graduate Students. (1-3) Course may be repeated for credit. One and one-half hours of seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. This course provides new or expanded work in eco-nomics applied to business management issues. (F,SP) Staff

229A. Doctoral Seminar in Accounting I. (3) Students will receive no credit for 229A after taking 239A. Three hours of seminar per week. Prerequisites: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223A. A critical evaluation of accounting literature with emphasis on seminar contributions. Topics covered include research methodology in accounting, the private and social value of information. (SP)

229B. Doctoral Seminar in Accounting II. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223B. A critical evaluation of recent accounting literature involving empirical research. (F,SP)

229C. Doctoral Seminar in Accounting III. (3) Three hours of seminar per week. Prerequisites: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223C. A critical evaluation of recent accounting literature with emphasis on financial accounting. (F)

229D. Doctoral Seminar in Accounting IV. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Exploration of issues related to the internal accounting systems of large firms. The first part of the course focuses on the theory of mechanism design, while the second part applies this theory to a variety of man-agerial accounting questions. (SP)

229S. Research Seminar in Accounting. (2-4) Course may be repeated for credit. One-half to three hours of seminar per week. This section: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223D. Special topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff

229A. Doctoral Seminar in Finance I. (3;3;3) Three hours of seminar per week. Prerequisites: Graduate level econometrics required. Three hours of seminar per week. Prerequisites: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223D. Recent developments in financial economics, including the theory of intertemporal choice; information and business cycle; and portfolio optimization. The term structure of interest rates, asset market equilibrium, valuation of uncertainty, problems in information, financial econometrics, and empirical verification of financial models. (F,SP)

239A. Market Microstructure. (1.5) Three hours of lecture per week for eight weeks. Prerequisites: Grad-uate level microeconomic theory required. Prerequisite: Introductory course in micro or general theory is recommended. Study and introduction to issues in empirical asset pricing. Students learn key features of asset-price behavior and study how researchers test various theoretical models from finance and economics, focusing on advantages and disadvantages of research designs. Intuition behind practical econometric tools is developed and applied to asset-pricing questions. By critically evaluating research, students determine which characteristics of an empirical paper influence the finance profession. (F,SP)

239B. Corporate Finance. (1.5) Three hours of lecture per week for eight weeks. Prerequisites: Graduate course in corporate finance recommended. Study of the financial decisions made by firms and the effect of such decisions on observables. These can include debt/equity ratios, dividend policies, or the cost of capital. The course also examines how the corporate finance conflicts interests between shareholders and managers and between different financial and economic claims. (F,SP)

239S. Research Seminar in Finance. (2-4) Course may be repeated for credit. One-half to three hours of seminar per week. This section: Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223D. Special topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff

269A. Seminar in Marketing: Buyer Behavior. (3) Three hours of seminar per week. Prerequisites: Con-sent of instructor. Formerly Business Administration 269A. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff

269B. Seminar in Marketing: Choice Modeling. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Business Administration 269B. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff

269C. Seminar in Marketing: Marketing Strategy. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Business Administration 269C. Advanced topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff

269S. Research Seminar in Organizational Behav-ior and Industrial Relations. (2-4) Course may be repeated for credit. One-half to three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Advanced study in the field of organiza-tional behavior and industrial relations. Topics will vary from year to year and be announced at the begin-ning of each semester. (F,SP)

270. Workshop in Institutional Analysis. (2) Students will receive no credit for 270 after taking Eco-nomics 225. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Economics 100 or 101; Business Administration 202A or equivalent, and Economics 201A-201B. Formerly Business Administration 223D. Special topics seminar intended principally for Ph.D. students but open to advanced MBA students. (F,SP) Staff
law, economics, and organization—is maintained. Markets, hierarchies, hybrids, bureaucracies, and the supporting institutions of law and politics all come under scrutiny. The aspiration is to progressively build toward a new science of organization. Also listed as Economics C225. (F,SP) Staff

279A. Institutions, Interest Groups and Public Policy. (3) Three hours of seminar per week. Prerequisites: Ph.D. student or consent of instructor. Formerly Business Administration 279A. Surveys recent literature on public decision making in government institutions, emphasizing a systematic framework for evaluating questions of public policy formation. Explores how institutions in political science apply the methods of rational choice theory to political problems, and links relevant theoretical and empirical literatures in economics and political science. Consideration of the problems of corporate strategy and business-government relations. (SP)

279B. The Political Economy of Capitalism. (3) Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. Formerly Business Administration 279B. Comprehensive introduction to historical development of contemporary capitalism. Class will: (1) compare the “classics” in political economy and their alternative explanations of markets, politics, class, and culture in industrial development; (2) provide a theoretical view of the history of the economic system and business institutions; and (3) examine competing theories of the corporation. (SP)

279C. Corporate Strategy and Technology. (3) Three hours of seminar per week. Prerequisites: Ph.D. student standing or consent of instructor. Formerly Business Administration 279C. The course has two broad objectives: (1) providing an overview of important work (mainly empirical) in the economics of technological change and technology policy and (2) analyzing the role of technological and organizational scientific innovation in firm strategy and performance. (F,SP)

279I. Economics of Innovation. (3) Course may be repeated for credit. Credit will be received for C279I after taking Economics 222. Three hours of lecture per week. Study of innovation, technological change, and intellectual property, including the industrial organization and performance of high-technology industries and firms; the use of economic, patent, and other bibliometric data for the analysis of technical change; legal and economic issues of intellectual property rights; science and technology policy, and the contributions of innovation and diffusion to economic growth. Methods of analysis are both theoretical and empirical, economic and case study. Also listed as Economics C222. (F,SP) Staff

279S. Research Seminar in Business and Public Policy. (2-4) Course may be repeated for credit. One-half to three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Advanced study in the field of business and public policy. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

289A. Doctoral Seminar in Real Estate. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor. Formerly Business Administration 289A. Doctoral real estate seminar. Discusses advanced real estate investment, development, and investment analysis. The course is rigorous and technical, applying financial and economic analysis to the subject areas of real estate finance, urban real estate economics, and real estate evaluation. (F,SP) Staff

289S. Research Seminar in Real Estate. (2-4) Course may be repeated for credit. One-half to three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Advanced study in the field of real estate. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

297B. Research and Theory in Business: Behavioral Science. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Ph.D. student or consent of instructor; previous work in statistics and probability theory. Formerly Business Administration 292B. The focus is upon designing a research problem and the use of techniques to analyze problems that include topics such as causality, analysis of variance, experimental design, survey research, observation, and multivariate analytical techniques. (F)

297T. Doctoral Topics in Business Administration. (1-3) Course may be repeated for credit. One-half to three hours of lecture per week. Advanced study in the field of business administration. Topics will vary from year to year and will be announced at the beginning of each semester. (F,SP)

299A. Individual Research in Business Problems. (1-12) Course may be repeated for credit. Forty-five hours of work per unit per term. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Ph.D. student standing and consent of instructor. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for a maximum of 16 units. Course does not satisfy unit or residence requirements for doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Formerly Business Administration 602. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. degree. (F,SP)

Professional Courses

300. Teaching Business. (2) Six hours of lecture and 24 hours of discussion per term. Must be taken on a satisfactory/unsatisfactory basis. This course will cover the broad range of knowledge and skills necessary to teach in top business schools. Teaching business effectively requires a myriad of pedagogical styles and techniques as well as the confidence and preparation necessary to convey the course material. This course seeks to prepare doctoral students for careers as faculty in business schools, giving them the insight and experience that will make their first courses successful ones. Students will learn effective teaching strategies by observing faculty mentors, reading pedagogical texts, and openly discussing the challenges and rewards of business instruction with experienced faculty and graduate student instructors (GSIs). Students will improve their teaching skills by implementing running courses as so as to better facilitate learning in the future classes. (F,SP) Staff

Celtic Studies

(College of Letters and Science)

Program Office: 6303 Dwinelle Hall, (510) 642-4484
Undergraduate Student Services: (510) 642-4661
celtic@berkeley.edu
Director: Eve Sweetser, Ph.D.
Advisory Committee
Gary Holland (Linguistics)
Kathryn Koe (Celtic Studies)
Daniel Melia (Celtic Studies)
Jennifer Miller (English)
Annalise Reihin (Celtic Studies)
Eve Sweetser (Linguistics)

The undergraduate student services adviser is located in 6303 Dwinelle Hall: (510) 642-4661.

Major in Celtic Studies

The program in Celtic studies is designed to give students both a broad understanding of the place of Celtic languages and cultures in the world and a firm grounding in one or more of the Celtic languages. The program varies from year to year, at least three semesters of language study and the other major requirements, students will be required to organize their studies with reference to one other methodological or disciplinary area chosen from anthropology, art history, comparative literature, linguistics, history, rhetoric, Scandinavian, or another language and literature. Some students may find it advantageous to declare a minor in one of the language departments that offers it. Students interested in the major should consult the student services adviser at the Celtic Studies office in the ISSA Cluster in 6303 Dwinelle Hall.

Major Requirements

Lower Division. Celtic Studies 70 plus two semester courses from the following course sequences: 15 and 85 or 16 and 86, or the equivalent. Students with prior knowledge of a Celtic language may apply for Credit by Examination.

Upper Division. Upper division courses, totaling at least 32 units, include either 128 or 129, 139, and C168 or 169. One class from the following list must be taken: 102A, 102B, 105A, 105B, 14A, 14B, 14A, 146A, 146B. Also, 8 units must be included from among the following: 118A, 118B, 119A, 119B, 125, or 126. Electives: In addition, upper-division elective courses may be selected from Celtic Studies 161, 169, 170, 171, and courses not used in fulfillment of major requirements. Scandinavian 123, C160, and 165 may also count toward the major. Courses from the following list may be taken with the approval of the major adviser: Anthropology 180; Art History 160; Comparative Literature 152 and 165; History 150A, 151A, 151B, and 185A; Linguistics 130 or 131.

Minor in Celtic Studies

Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their major. The minor in Celtic studies requires:

Lower Division. Celtic Studies 70.

Upper Division. Five upper division courses chosen from the minor list and approved by the major adviser. All upper division courses applied to the minor must be completed on a letter-graded basis; at least three of the five courses must be completed at Berkeley, and a minimum overall GPA of 2.0 is required in the upper division courses applied to the minor.

Students interested in the minor should contact the student services officer at the Celtic Studies office in the ISSA Cluster in 6303 Dwinelle Hall.

Honors Program

In order for students to graduate with honors in Celtic studies, they must have achieved an overall GPA of 3.3 or higher in all work completed in the major. A minimum 3.0 GPA in all courses required for the major, and they must have taken both Celtic Studies 128 and 129 (only one of the two is required for the major). Enrollment in the two-semester Honors Seminar course sequence H195A-B is required, culminating in a written honors thesis while enrolled in H195B.

Education Abroad

The University offers students the opportunity to study abroad in the Republic of Ireland, England, Scotland, Wales, and Northern Ireland. These programs feature language study along with courses in culture, history, literature, and many other areas within the humanities and social sciences. Courses may be applied toward language and upper division credit in the major or minor with advance approval of the major adviser. Details of the programs are available from Berkeley Programs for Study Abroad, 160 Stephens Hall; (510) 642-1356; or studyabroad.berkeley.edu.
Graduate Studies

Although no graduate degrees in Celtic studies are offered at present, it is possible to pursue research in Celtic languages, literature, history, anthropology, etc., in a variety of departments. Dissertations on Celtic subjects have been accepted in the Departments of Comparative Literature, Linguistics, Rhetoric, English, and Anthropology, and in the Folklore Program.

Lower Division Courses

R1A-R1B. Voices of the Celtic World. (4:4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing requirement or equivalent; R1A or equivalent is prerequisite to R1B. Formerly 1A-1B. Reading and discussion based on works of Celtic writers both in English and in translations from Celtic languages. In addition to training in textual analysis and descriptive and argumentative writing, the courses will discuss the notion of Celtic “voices”: distinctive modes of cultural expression chosen by important authors from a Celtic milieu. Readings will be chosen from a variety of modern Irish, Welsh, highland Scots, and Breton writers. R1A satisfies the first half of the Reading and Composition requirement, and R1B satisfies the second half. (F.SP) Staff

15. Elementary Modern Irish. (4) Three hours of language instruction and one hour of laboratory per week. A beginning course in modern Irish. Students will be learning both Irish grammar, and developing ability to understand, speak, read, and write the language. (F.SP) Staff

16. Introduction to Modern Welsh. (4) Three hours of language instruction and one hour of laboratory per week. Introduction to modern Welsh conversation and grammar. Emphasis in the first-semester class is on pronunciation, mastering consonant mutations, using several tenses (present, perfect, imperfect, past), and the acquisition of basic vocabulary and idiom. Simple, modern texts based on traditional Welsh stories will supplement classroom oral-aural work. (F) Klar, Rejhorn

70. The World of the Celts. (4) Three hours of lecture per week. An overview of the history of Celtic-speaking peoples from Indo-European times, including linguistic/archaeological evidence for the emergence of the Celtic language group in first millennium B.C. Europe. Celtic religion and comparative Indo-European mythology. Discussion of the validity of classical reports of the Celtic culture. Celtic tribal migrations in the historical period; the foundation of Brittany. The decline and suppression of modern Celtic languages; Celts in the New World. (F.SP) Melia

85. Intermediate Modern Irish. (4) Three hours of language instruction and one hour of laboratory per week. Emphasis on grammar and vocabulary. Prerequisites: 16: or 6 and 75 or consent of instructor. Formerly 6B. Continuing instruction in speaking, comprehension, reading and writing skills. By the end of this semester, students will have become acquainted with all of the central grammatical constructions of Irish and be ready to begin reading accessible Irish prose. (F.SP) Staff

86. Intermediate Modern Welsh. (4) Three hours of language instruction and one hour of laboratory per week. Prerequisites: 16: or 6 and 75 or consent of instructor. Formerly 6B. Continuing instruction in speaking, comprehension, reading and writing skills. By the end of the semester, students will have become acquainted with all of the central grammatical constructions of Welsh and be ready to begin reading accessible Welsh prose. (F.SP) Staff

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/no credit basis. Prerequisites: Freshman and sophomore standing and consent of instructor. Directed individual study on special topics approved by Celtic Studies. (F.SP) Staff

Upper Division Courses

102A. Elementary Breton. (4) Three hours of lecture and one optional hour of laboratory per week. Prerequisites: 101A or consent of instructor. Formerly 1A-1B. This course will cover the basics of Breton grammar and vocabulary, including simple everyday vocabulary and basic conversation. (F.S.P) Staff

102B. Advanced Breton. (4) Three hours of lecture and one optional hour of discussion per week. Prerequisites: 102A or consent of instructor. Formerly 120A. Advanced readings in Breton. Continuation of Celtic Studies 102A. This course will teach students to speak, read, and write modern literary Breton. It will follow the curriculum established by the only good Breton text in English, which will be supplemented with exercises and readings from current Breton publications and contemporary literature. (F.S.P) Staff

105A. Old and Middle Irish. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 5 and 75 or consent of instructor. A detailed introduction to the orthography, phonology and grammar of Old Irish designed to provide the student with the subsequent capacity to read with comprehension and to translate (with the aid of dictionary or glossary) any edited text in Old Irish or Middle Irish. (F.S.P) Staff

105B. Readings in Old and Middle Irish. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Successful completion of Celtic Studies 105A or equivalent. Designed to offer students who have already taken the basic elementary course in Old and Middle Irish (105A) further opportunity to work with important texts written in the period 700-1200 and to refine their knowledge of the language and its uses. Readings in Latin and classical authors will extend the vocabulary and grammatical knowledge acquired in the first semester of modern Irish. Readings in Irish literature will be a major focus of the curriculum but will also be accompanied by advanced grammatical instruction designed to prepare students for the completion of a two-semester formal instruction. Continued stress on vocabulary building and reading of texts with intensive conversation drills to activate the learned vocabulary. Idiomatic usage will be reinforced in both oral and written exercises. Class activities will include conversation and discussion of assigned texts in Irish. (F.S.P) Staff

119B. Welsh and Arthurian Literature of the Middle Ages. (4) Course may be repeated; 102A. Advanced readings in Breton. Continuation of Celtic Studies 102A. This course will cover the basics of Breton grammar and vocabulary, including simple everyday vocabulary and basic conversation. (F.S.P) Staff

125. Irish Literature in Translation. (4) Course may be repeated; 102A. Advanced readings in Breton. Continuation of Celtic Studies 102A. This course will cover the basics of Breton grammar and vocabulary, including simple everyday vocabulary and basic conversation. (F.S.P) Staff

125. Irish Literature in Translation. (4) Course may be repeated; 102A. Advanced readings in Breton. Continuation of Celtic Studies 102A. This course will cover the basics of Breton grammar and vocabulary, including simple everyday vocabulary and basic conversation. (F.S.P) Staff

127. Irish Literature. (4) Three hours of lecture per week. Formerly 125A-125B. A selective study of elementary works of modern Irish literature. Texts include novels, short stories, and poetry and will concentrate in the first two-thirds of the semester on works originally written in Irish. All work will be read in English, but the course will be coordinated with 106A-106B for those who wish to do some of the readings in Welsh. (SP) Staff

128. Medieval Celtic Culture. (4) Three hours of lecture per week. Formerly 16-50. An introduction to the development of the legendary tradition as a whole. Texts include both prose and poetry, and major genres such as epic, legend, and mythology. (F.S.P) Staff

129. Aspects of Modern Celtic Cultures and Folklore. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. A comparative introduction to modern Celtic cultures: principally Irish, Welsh, Scottish Gaelic, and Breton. The development of the distinctive cultures of the Celts “nations without states” from 1500 to the present; and an examination of the role of minority cultures and minority languages in larger political cultural entities. Theme topics will be chosen but may include folklore, nationalism, and linguistic history from time to time. (F.S.P) Staff

138. Irish Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 105A or consent of instructor. Course continues the Celtic Studies 16-86 sequence. Study of the prose saecus-cycles, satire, classificatory poetry, and the mythological and traditional background of modern Irish literature. (F.S.P) Staff

139. Irish Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Irish literature 1800 to the present. (F.S.P) Staff

144A. Modern Welsh Level 3. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 16 and 86 or consent of instructor. Course continues the Celtic Studies 16-86 sequence. Study of the prose saecus-cycles, satire, classificatory poetry, and the mythological and traditional background of modern Irish literature. (F.S.P) Staff

144B. Modern Welsh Level 4. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Two semesters Irish language or consent of instructor. The third level course in modern spoken Welsh. Introduction to works of important modern Welsh authors from a Celtic milieu. Readings will be chosen from current Breton publica- tions and will supplement classroom oral-aural work. (F.S.P) Staff

145A. Intermediate Irish Language. (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: Two semesters Irish language or consent of instructor. The third level course in modern spoken Welsh. Introduction to works of important modern Welsh authors from a Celtic milieu. Readings will be chosen from current Breton publica- tions and will supplement classroom oral-aural work. (F.S.P) Staff

145B. Modern Irish Level Four. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 145A or consent of instructor. The fourth semester of modern Welsh literature. Readings in Irish literature will be a major focus of the curriculum but will also be accompanied by advanced grammatical instruction. (F.S.P) Staff

146A. Medieval Welsh Language and Literature. (4) Three hours of lecture per week. Selected works of medieval Welsh prose and poetry are read in Middle Welsh. Grammar instruction and in-class translations provide a historical and cultural basis for understanding medieval Welsh literature. (F.SP) Klar, Rejhorn

146B. Medieval Welsh Language and Literature. (4) Three hours of lecture per week. Prerequisites: 105B or consent of instructor. A selection of medieval Welsh prose and poetry is read in Middle Welsh in conjunction with lectures on the medieval Welsh language and tradition. (F.S.P) Klar, Rejhorn

Celtic Mythology and Oral Tradition. (4) Three hours of lecture per week. The course will introduce students to the pre-Christian beliefs of the Celtic and Indo-European worlds; the historical narratives in which such beliefs are embedded; and the method- ology of investigating ancient and medieval belief sys- tems. Also listed as Religious Studies C109. Staff

170. Topics in Celtic Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Completion of reading and composition 1A-1B or equivalent; consent of instructor. Topics include offerings on areas of Celtic language and culture that are not covered in other Celtic studies courses. Topics might include, but would
Upper Division Courses

140. Introduction to Chemical Process Analysis. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 4B or 1B with a grade of C- or better; and Physics 7B (may be taken concurrently). Introduction to the basic concepts of the analysis of energy balances applied to chemical process systems. Determination of thermodynamic properties needed for such calculations. Sources of data. Calculation procedures. (F) Staff

141. Chemical Engineering Thermodynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 with a grade of C- or higher; Engineering 7, which may be taken concurrently, or an acceptable computer programming transfer course. Thermodynamic behavior of pure substances and mixture of substances. Phase diagrams and solutions, phase equilibria. Thermodynamic cycles. Chemical equilibria for homogeneous and heterogeneous systems. (SP)

142. Chemical Kinetics and Reaction Engineering. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 141; 150B, which may be taken concurrently. Analysis and prediction of rates of chemical conversion in flow and nonflow processes involving homogeneous and heterogeneous systems. (F)

150A. Transport Processes. (4) Three hours of lecture, three hours of laboratory per week. Prerequisites: 140 with a grade of C- or higher; Math 54, which may be taken concurrently. Principles of fluid mechanics and heat transfer with application to chemical processes. Analysis of laminar and turbulent flow in pipes and around submerged objects. Flow measurement. Heat conduction and convection; heat transfer coefficients. Design of staged and continuous separations processes. (F)

150B. Transport and Separation Processes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 140 with a grade of C- or higher; Engineering 7 or an acceptable computer programming transfer course. Principles of mass transfer with application to chemical processes. Diffusion and convection in heat and mass transfer; mass transfer coefficients. Design of staged and continuous separations processes. (F)

154. Chemical Engineering Laboratory. (4) One hour of lecture and eight hours of laboratory per week. Prerequisites: 141; 150B. Experiments in physical measurements, fluid mechanics, heat and mass transfer, kinetics, and separation processes. Emphasis on investigation of basic relationships important in engineering. Experimental design, analysis of results, and preparation of reporting papers are stressed. (F,SP)

160. Chemical Process Design. (4) Three hours of lecture, one hour of discussion, and three hours of computer laboratory per week. Prerequisites: 142; 150B. Design and operation of chemical process equipment. Design of integrated chemical processes with emphasis upon economic considerations. (F,SP)

162. Dynamics and Control of Chemical Processes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 150B; Math 53 and 54. Analysis of the dynamic behavior of chemical processes and methods and theory of their control. Implementation of computer control systems on process simulations. (F,SP)

170A. Biochemical Engineering. (3) Three hours of lecture per week. Prerequisites: 150B or consent of instructor. Formerly 170. The first of a two-semester sequence intended to introduce chemical engineers to the basic concepts of biochemical engineering. The course focuses on the use of chemical engineering skills and principles in the analysis and design of biologically-based processes. No previous background in the biological sciences has been assumed, and no subsection of the course has been set aside to cover fundamentals of biochemical, biotechnology, molecular biology, or microbiology. Instead, such material will be introduced as necessary throughout the course. The main emphasis of the 170A-170B sequence will be on biochemical kinetics, heat and mass transfer, thermodynamics, and transport phenomena as they apply to enzyme catalysis, protein engineering, microbial growth and metabolism, fermentation and bioreactor design, product recovery, and downstream processing. (F) Clark

170B. Mass and Biochemical Engineering. (3) Three hours of lecture per week. Prerequisites: 170A. Formerly 170. The second of a two-semester sequence intended to introduce chemical engineers to the basic concepts of biochemical engineering. The course focuses on the use of chemical engineering skills and principles in the analysis and design of biologically-based processes. The main emphasis of the 170A-170B sequence will be on biochemical kinetics, heat and mass transfer, thermodynamics, and transport phenomena as they apply to enzyme catalysis, protein engineering, microbial growth and metabolism, fermentation and bioreactor design, product recovery, and downstream processing. (SP) Clark

170L. Biochemical Engineering Laboratory. (3) Six hours of laboratory and one hour of lecture per week. Prerequisites: 170A (may be taken concurrently) or consent of instructor. Laboratory techniques for the cultivation of microorganisms in batch and continuous reactions. Enzymatic conversion processes. Recovery of biological products. Also listed as Chemistry C170L. (F)

171. Transport Phenomena. (3) Three hours of lecture per week. Prerequisites: 150B. Study of momentum, energy, and mass transfer in laminar and turbulent flow. (F)

176. Principles of Electrochemical Processes. (3) Three hours of lecture per week. Prerequisites: 141; 150B. Principles and application of electrochemical equilibria, kinetics, and transport processes. Technical electronics and electrochemical energy conversion. (F)

178. Polymer Science and Technology. (3) Three hours of lecture and three hours of laboratory per week. An interdisciplinary course on the synthesis, characterization, and properties of polymer materials. Emphasis on the molecular origin of properties of polymeric materials. Materials include single molecule properties, polymer mixtures and solutions, melts, glasses, elastomers, and crystals. Experiments in polymer synthesis, characterization, and physical properties. Also listed as Chemistry C178. (F,SP) Segalman

179. Process Technology of Solid-State Materials Devices. (3) Three hours of lecture/laboratory per week. Prerequisites: Engineering 45; one course in electronic circuits required; senior standing; consent of instructor. Chemical processing and properties of solid-state materials. Crystal growth and purification. Thin film technology. Application of chemical processing to the manufacture of semiconductors and solid-state devices. (SP)

194. Research for Advanced Undergraduates. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Minimum GPA of 3.4 overall at Berkeley and consent of instructor. Original research under direction of one of the members of the staff. (F,SP)

195. Special Topics. (2-4) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor. Lectures and/or tutorial instruction on special topics. (F,SP)

196. Special Laboratory Study. (2-3) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor. Special laboratory or computational work under direction of one of the members of the staff. (F,SP)

197. Field Study in Chemical Engineering. (1-4) Course may be repeated for credit. Three hours of fieldwork per week. Permission on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience in off-campus organizations relevant to specific aspects of chemical engineering. Written report required at the end of the term. Course does not satisfy unit or residence requirements for the bachelor’s degree. (F,SP) Strauss

198. Directed Group Study for Undergraduates. (1-3) Course may be repeated for credit. One hour of lecture per week per unit. Must be taken on a passed/not passed basis. Completion of 60 units of undergraduate study and in good academic standing. Supervised research on a specific topic. Enrollment is restricted; see the Introduction to Courses and Curricula section in this catalog. (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Six hours of independent study per week. Must be taken on a passed/not passed basis. (F,SP) Staff

Graduate Courses

230. Mathematical Methods in Chemical Engineering. (3) Three hours of lecture per week. Prerequisites: Math 53 and 54 or equivalent; open to seniors with consent of instructor. Part I. Topics include partial differential equations, variational calculus, and Fourier solutions. Application of numerical techniques to chemical engineering calculations with emphasis on computer methods.

240. Thermodynamics for Chemical Product and Process Design. (3) Three hours of lecture per week. Prerequisites: Math 53 and Math 54 or equivalent. 141 or equivalent; open to seniors with consent of instructor. Topics covered include classical thermodynamics of pure substances and mixtures, interfacial thermodynamics, statistical mechanics, and computer simulations. (F)

244. Kinetics and Reaction Engineering. (3) Three hours of lecture per week. Prerequisites: 244 or Chemistry 223, or consent of instructor. Adsorption and kinetics of surface reactions; catalyst preparation and characterization; poisoning, selectivity, and empirical activity patterns in catalysis; surface chemistry, catalytic mechanisms and experimental techniques in catalytic research; descriptive examples of industrial catalytic systems. (SP)

246. Principles of Electrochemical Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Electrode processes in electrolysis and in galvanic cells. Charge and mass transfer in ionic media. Criteria of scale up.

248. Applied Surface and Colloid Chemistry. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Adsorption and kinetics of surface reactions; catalyst preparation and characterization; poisoning, selectivity, and empirical activity patterns in catalysis; surface chemistry, catalytic mechanisms and experimental techniques in catalytic research; descriptive examples of industrial catalytic systems. (SP)

249. Biochemical Engineering. (3) Three hours of lecture per week. Prerequisites: 150A, 150B, Molecular and Cell Biology 102; Chemistry 112B, 120B; or consent of instructor. Application of chemical engineering principles to the processing of biological and biochemical materials. General topics include models for cultivation of microorganisms and for the separation and purification of biological products.

250. Transport Processes. (3) Three hours of lecture per week. Prerequisites: 150A, 150B, and 230, or equivalent; open to seniors with consent of the instructor. Analysis of differential equations; conservation laws; and momentum transport for Newtonian and non-Newtonian media.

B prefix=language course for business majors
C prefix=course cross-listed course
H prefix=honors course
R prefix=course satisfies R&Q requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course
†Recipient of Distinguished Teaching Award

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nian fluids; exact solutions of Navier-Stokes equations; scaling and singular perturbations; creeping flow; laminar boundary layers; turbulence; hydrodynamic stability. (SP)

256. Advanced Transport Phenomena. (3) Three hours of lecture per week. Prerequisites: 230. Muralization and rigorous analysis of the laws governing the transport of momentum, heat, and mass, with special emphasis on chemical engineering applications. Detailed investigation of fluid flow, mass transfer, and heat transfer by treatments of turbulent flow systems and hydrodynamic stability. (SP)

C268. Physicochemical Hydrodynamics. (3) Three hours of lecture per week. Prerequisites: A first graduate course in chemical engineering is recommended. An introduction to the hydrodynamics of capillarity and wetting. Balance laws and short-range forces. Dimensionless numbers, scaling and lubrication approximation. Rayleigh instability. Marangoni effect. The moving contact line. Wetting and short-range forces. The dynamic contact angle. Dewetting. Coating flows. Effect of surfactants and electric fields. Wetting of rough or porous surfaces. Contact angles for evaporating systems. Also listed as Mechanical Engineering C268. (SP) Morris

C270. Protein Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. An in-depth study of the current methods and recent developments in protein engineering. Emphasis on how strategies can be applied in the laboratory. Relevant case studies presented to illustrate method variations and applications. Intended for graduate students. Also listed as Bioengineering C219. (F) (T) Fullman-Erickson

295. Special Topics in Chemical Engineering. Pre-requisites: Open to properly qualified graduate students. Current and advanced study in chemical engineering, primarily for advanced graduate students. (F,SP)

295C. Applied Molecular Theory for Chemical Engineers. (3) Three hours of discussion per week. Prerequisites: Consent of instructor. Formerly C200. Explore strategies for maximizing the economic and societal benefits of synthetic biology and minimization of synthetic biology’s footprint on future research projects in synthetic biology at UC Berkeley; increase multidisciplinary collaborations at UC Berkeley on synthetic biology; and introduce students to a wide perspective of SB projects and innovators as well as policy, legal, and ethical experts. (SP) Arkin, Keasling

C295M. Topics in Fluid Mechanics. (1,2) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Pre-requisites: Two hours of lecture on special topics which will be announced at the beginning of each semester that the course is offered. Topics may include transport and mixing, geophysical fluid dynamics, biofluid dynamics, oceanography, free surface flows, non-Newtonian fluid mechanics, among other possibilities. Also listed as Environ Sci, Policy, and Management C291, Physics C290C, Material Sciences C290C, C290L, Civil and Environmental Engineering C290K, Mechanical Engineering C298A, and Bio-engineering C299OC. (SP) Staff

295N. Polymer Physics. (3) Three hours of lecture per week. Prerequisites: 230 and 240. This course is based on the book Physics of Polymers by Robert F. Feng and will introduce the polymer scientist to the origin of some of the important physical properties of polymer liquids and solids. This includes phase transitions, crystallization, morphology of multiphase polymer systems, mechanical properties, response to mechanical and electric fields, and fracture. When possible, we will develop quantitative molecular models that predict macroscopic behavior. The course will address experimental data obtained by microscopy, light and neutron scattering, rheology, and dielectric relaxation. (SP)

295P. Introduction to New Product Development. (3) Prerequisites: Graduate standing or consent of instructor. This course is part of the product development initiative sponsored by the department of chemical engineering. It focuses on real-life practices and challenges of translating scientific discovery into commercial products. Its scope is limited in most circumstances to situations where some knowledge of chemical engineering principles is required. The course is designed to be particularly useful for the student who is considering a career in the field. We cover a wide range of topics including basic financial, strategic and intellectual property concepts for products; managing risk and uncertainty; the technical and business aspects of the team; the evolving role of corporate R&D; and the new venture product company; and the ethics of post-launch product management. (F) Alexander

295Q. Advanced Topics in New Product Development. (3) Prerequisites: Graduate standing or consent of instructor. This course is part of the product development initiative sponsored by the department of chemical engineering. The course builds on the coverage in 295P of real-life practices of translating scientific discovery into commercial products. We will cover a broad range of advanced product development concepts including technology road maps, decision analysis, Six Sigma, product portfolio optimization, and best practices for field service management. (SP) Reimer

C295R. Applied Spectroscopy. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering, physics, chemistry, or chemical engineering; courses: quantum mechanics, linear vector space theory. After a brief review of quantum mechanics and semi-classical theories for the interaction of radiation with matter, this course will survey the various spectroscopies associated with the electromagnetic spectrum from gamma rays to radio waves. Special emphasis is placed on application to research problems in applied and engineering sciences. Graduate researchers interested in systematic in situ process characterization, analysis, or discovery are best served by this course. Also listed as Applied Science and Technology C295SP. (SP) Reimer

295S. Introduction to Experimental Surface Chemistry. (3) Prerequisites: 240 or equivalent. This course is intended to introduce chemical engineering students to the concepts and techniques involved in the study of chemical processes at surfaces. Special emphasis will be placed on the chemistry of semiconductor surfaces. Topics to be covered include thermodynamics and kinetics of surfaces; crystal and electronic structures of clean surfaces (metals and semiconductors); adsorption and desorption; surface kinetics and dynamics including diffusion; dynamics of growth and etching; surface reaction models; and a survey of modern surface analytical techniques including electron microscopy, and mass spectrometry. (F,SP)

295V. Mass Transfer. (2) Prerequisites: Open to properly qualified graduate students. Special emphasis is placed on application to research problems in fluid mechanics problems by means of the finite element method. Topics will include finite element methods for nonlinear and time-dependent problems and approximation elements such as compressible Navier-Stokes equations, free and moving boundary flows, computer-aided stability and bifurcation analysis, and recent developments in the finite element method of viscous flows. (SP) Staff

295W. Mass Transfer. (2) Prerequisites: Graduate standing or consent of instructor. Fundamental principles of mass transfer with application to design of mass transfer processes. Theory of diffusion in gases and liquids for single and multicompartment species. Mass transfer in laminar and turbulent flows. Transport analogies, simultaneous heat, and mass transfer. Mass transfer with chemical reaction. Interfacial mass transfer and mass transfer in two-phase flows. Design of packed beds and columns, gas sparged reactors. (SP)

296. Special Study for Graduate Students in Chemical Engineering. (1-6) Course may be repeated for credit. Individual conferences. Sections 1-14 and 11-25 to be graded on a satisfactory/unsatisfactory basis; 15-20 to be graded satisfactory or unsatisfactory. Also listed as Mechanical Engineering 219. (SP) Reimer

297. Seminar in Chemical Engineering. (1-6) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Also listed as Mechanical Engineering 219. (SP) Reimer
The college offers programs leading to the B.S., chemistry, and chemical engineering. Students covering new sources of energy, recovering and recycling, surface science, catalysis, biomolecular engineering, theoretical chemistry, nuclear chemistry, organic chemistry, biophysical chemistry, and chemical biology, condensed matter and surface science, catalysis, biomolecular engineering, and synthetic biology, multiscaling models and computer simulation, micro- and nanosystems and technologies, and polymers and polymer physics.

Recommended high school preparation for chemistry, chemical biology, or chemical engineering should include chemistry (one year; AP chemistry strongly recommended); physics (one year); mathematics (four years, including trigonometry, intermediate algebra, analytical geometry, and pre-calculus), and a foreign language (two or three years).

For more specific descriptions of the degree programs, see the College of Chemistry Guide.
Chemistry Major in the College of Chemistry (B.S. Degree)

The requirements for a B.S. degree in the College of Chemistry, with a chemistry major, are: a total of 120 semester units; Mathematics 1A, 1B, 53, 54; Physics 7A, 7B; Chemistry 4A, 4B, 104A, 104B, 112A, 112B, 120A, 120B, 125; and a choice of 105, 108, 109, 115, 125, 126, 127B, or 130B. Four of the specified courses, the B.S. chemistry major consist of 15 units of advanced study in chemistry and related fields, including at least one lecture course in chemistry. These courses permit the student to emphasize his major in areas of personal interest or to specialize in some related field, such as physics, biology, geology, mathematics, materials science, nuclear science, or to complete pre-medical requirements. In addition to these 15 units of advanced science courses, a portion of 15 units of breadth electives (see below) can be used for coherent programs in interdisciplinary areas. Chemistry majors who choose a concentration in material related fields must complete Chemistry C150, two chemistry laboratory courses (105 or 125, plus 108 or 115), and 10 units of upper division electives. These courses are taken in place of Chemistry 115, or 116, and 15 units of advanced study in chemistry and related fields.

The following requirements must also be satisfied: Entry-level Writing; American History and Institutions; American Cultures; second-semester foreign language course or equivalent; and a prograss of 15 units in reading and composition (English R1A and R1B or equivalent), humanities, and social sciences to fulfill the breadth requirement. See the College of Chemistry Guide for additional information about the chemistry program.

Chemical Biology Major

The requirements for a B.S. degree in chemical biology are as follows: a total of 120 semester units; Mathematics 1A, 1B, 53, 54; Physics 7A, 7B (8A, 8B may be taken in place of 7A, 7B, but 7A, 7B are recommended); Biology 1A and 1AL; Chemical Biology 125, 130A, 130B, and one of 105, 125, C170L, or C182; Molecular and Cell Biology 110, 110L. In addition to these specified courses, the B.S. chemical biology major consists of 7 units of advanced study in chemistry and related fields, including at least one lecture course in chemistry.

The following requirements must also be satisfied: Entry-Level Writing; American History and Institutions; American Cultures; second-semester foreign language course or equivalent; and a prograss of 15 units in reading and composition (English R1A and R1B or equivalent), humanities, and Social Sciences to fulfill the breadth requirement. See the College of Chemistry Guide for additional information about the chemical biology program.

Undergraduate Research. Students are encouraged to participate in individual undergraduate research in collaboration with one of the faculty during their junior or senior year.

Intercollegiate Transfers. Transfer applicants are expected to complete, at a minimum, courses equivalent to Chemistry 1A-1B, Mathematics 1A-1B, Physics 7A (Physics 7A or 8A for chemical biology majors), English R1A-R1B, and two additional courses toward the major before transfer. In addition, completion of additional chemistry, mathematics, calculus-based physics, and some biology is encouraged. Chemistry and chemical biology majors who transfer without having covered equivalent courses are required to take a quantitative analysis course after transfer. Note: Coursework taken the summer before enrollment at Berkeley is not considered in the selection of applicants.

Chemistry Major in the College of Letters and Science (B.A. Degree)

The requirements for a B.A. degree in chemistry are as follows: a total of 120 semester units; Mathematics 1A, 1B, 53, 54; Physics 7A, 7B; Chemistry 4A, 4B, 104A, 104B (103 and 135 may be taken in place of 104A, 104B), 112A, 112B, 120A, 120B, 125; and a choice of 105, 108, 109, 115, 125, 126, 127B, or 130B. Four of the specified courses, the B.A. chemistry major consists of 15 units of advanced study in chemistry and related fields, including at least one lecture course in chemistry. These courses permit the student to emphasize his major in areas of personal interest or to specialize in some related field, such as physics, biology, geology, mathematics, materials science, nuclear science, or to complete pre-medical requirements. In addition to these 15 units of advanced science courses, a portion of 15 units of breadth electives (see below) can be used for coherent programs in interdisciplinary areas. Chemistry majors who choose a concentration in material related fields must complete Chemistry C150, two chemistry laboratory courses (105 or 125, plus 108 or 115), and 10 units of upper division electives. These courses are taken in place of Chemistry 115, or 116, and 15 units of advanced study in chemistry and related fields.

The following requirements must also be satisfied: Entry-level Writing; American History and Institutions; American Cultures; second-semester foreign language course or equivalent; and a prograss of 15 units in reading and composition (English R1A and R1B or equivalent), humanities, and social sciences to fulfill the breadth requirement. See the College of Chemistry Guide for additional information about the chemistry program.

Chemical Biology Major

The requirements for a B.S. degree in chemical biology are as follows: a total of 120 semester units; Mathematics 1A, 1B, 53, 54; Physics 7A, 7B (8A, 8B may be taken in place of 7A, 7B, but 7A, 7B are recommended); Biology 1A and 1AL; Chemical Biology 125, 130A, 130B, and one of 105, 125, C170L, or C182; Molecular and Cell Biology 110, 110L. In addition to these specified courses, the B.S. chemical biology major consists of 7 units of advanced study in chemistry and related fields, including at least one lecture course in chemistry.

The following requirements must also be satisfied: Entry-Level Writing; American History and Institutions; American Cultures; second-semester foreign language course or equivalent; and a prograss of 15 units in reading and composition (English R1A and R1B or equivalent), humanities, and Social Sciences to fulfill the breadth requirement. See the College of Chemistry Guide for additional information about the chemical biology program.

Undergraduate Research. Students are encouraged to participate in individual undergraduate research in collaboration with one of the faculty during their junior or senior year.

Intercollegiate Transfers. Transfer applicants are expected to complete, at a minimum, courses equivalent to Chemistry 1A-1B, Mathematics 1A-1B, Physics 7A (Physics 7A or 8A for chemical biology majors), English R1A-R1B, and two additional courses toward the major before transfer. In addition, completion of additional chemistry, mathematics, calculus-based physics, and some biology is encouraged. Chemistry and chemical biology majors who transfer without having covered equivalent courses are required to take a quantitative analysis course after transfer. Note: Coursework taken the summer before enrollment at Berkeley is not considered in the selection of applicants.

Graduate Programs

Students interested in graduate study are invited to visit the department website for more information.

Lower Division Courses

1A. General Chemistry. (3) Students will receive no credit for 1A after taking 4A. Three hours of lecture and one hour of discussion per week. Prerequisites: High school chemistry recommended. Stoichiometry of chemical reactions, quantitative measurement of atoms, the periodic table, and periodic relationships. (F,SP)

1AL. General Chemistry Laboratory. (2) Students will receive no credit for 1AL after taking 4B. One hour of lecture and two hours of laboratory per week. Prerequisites: 1A (may be taken concurrently). An experimental approach to chemical sciences with emphasis on developing fundamental, reproducible laboratory technique and a goal of understanding and achieving precision and accuracy in laboratory experiment. Proper use of laboratory equipment and standard wet chemical methods are practiced. Areas of investigations include chemical equilibria, spectrophotometry, spectroscopy, chromatography, green chemistry, and physical chemistry. Concurrent enrollment in 1A is recommended. (F,SP)

1B. General Chemistry. (4) Students will receive no credit for 1B after taking 4B. Two hours of lecture and four hours of laboratory per week. Prerequisites: 1A or 1B and 3A, 3B, or 4A on the Chemistry AP test. Introduction to chemical kinetics, electrometry, properties of the states of matter, binary mixtures, thermodynamic efficiency and the direction of chemical reactions, quantum mechanics, including introduction to spectroscopy. Special topics: Research topics in modern chemistry and biochemistry, chemical engineering. (SP)

3A. Chemical Structure and Reactivity. (3) Students will receive no credit if completed before 3A. Three hours of lecture per week. Prerequisites: C or higher, or a score of 4 or 5 on the Chemistry AP test. Introduction to organic chemical structures, bonding, and chemical reactivity. The organic chemical bonds, alkanes, alkyl halides, alcohols, amines, ethers, aldehydes, ketones, aromatic hydrocarbons. (F,SP)

3B. Chemical Structure and Reactivity. (3) Students will receive no credit for 3B after taking 112B. Three hours of lecture per week. Prerequisites: 3A with a grade of C- or higher. Conjugation, aromatic chemistry, carbonyl compounds, carbohydrates, amines, carboxylic acids, amino acids, peptides, proteins, and nucleic acid chemistry. Ultraviolet spectroscopy and mass spectrometry will be introduced. Advanced spectroscopic methods including infrared, ultraviolet, and nuclear magnetic resonance spectroscopy and mass spectrometry will be used to analyze organic compounds prepared in the laboratory. Qualitative analysis of organic compounds will be covered. (F,SP)

4A-B. General Chemistry and Quantitative Analysis. (4) Students will receive no credit for 4A after taking 1A. Students will receive two units of credit for 4B after taking 1B. Students will receive one unit of credit for 4B after taking 15, 19, 49, or 54. Three hours of lecture and four hours of laboratory per week. Prerequisites: High school chemistry; calculus (may be taken concurrently); high school physics is recommended. This series is intended for majors in physical and biological sciences and in engineering. It presents the foundational principles of chemistry, including stoichiometry, thermodynamics, acid-base and solubility equilibria, oxidation-reduction reactions, thermodynamics, entropy, nuclear chemistry and radioactivity, the atoms and elements, the periodic table, quantum theory, chemical bonding, molecular structure, chemical kinetics, and descriptive chemistry. Examples and applications will be drawn from diverse areas of special interest such as atmospheric, environmental, materials, polymer and computational chemistry, and biochemistry. The course requires quantitative work. Equivalent to 1A-1B plus 15 as prerequisite for further courses in chemistry. (F)

15. Analytical and Bioanalytical Chemistry. (3) Students will receive two units of credit for 15 after taking 4B. Two hours of lecture and four hours of laboratory per week. Prerequisites: 1A or 1B and 3A, 3B, or 4A on the Chemistry AP test. Introduction to analytical and bioanalytical chemistry including background in statistical analysis of data, acid-base equilibria, electroanalytical potentiometry, spectrometry, and chromatographic methods of analysis and
some advanced topics in bioanalytical chemistry such as micro-fluidics, bioassay techniques, and enzymatic biosensors. (F)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to discuss a topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics may vary from department to department and semester to semester. Enrollment limited to 15 freshmen.

49. Supplementary Work in Lower Division Chemistry. (1-4) Course may be repeated for credit. Meetings to be arranged. Students with partial credit in lower division chemistry courses may, with consent of instructor, complete the credit under this heading. (F,SP)

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for 15 weeks. One and one-half hours of seminar per week per unit for 10 weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

C96. Introduction to Research and Study in the College. (1) One hour of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP)

98. Supervised Group Study. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One hour of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected topics.

98B. Issues in Chemistry. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: A score of 3, 4, or 5 on the Chemistry AP Test, or 1A or 4A (may be taken concurrently). This seminar will focus on one or several related issues in society that have a significant bearing on chemistry. Particular topics will differ from course section to course section and from year to year. Representative examples: atmospheric ozone, nuclear waste, solar energy, water, agrochemicals. Students will search information sources; invite expert specialists to speak; write research papers; and write research papers.

98W. Directed Group Study. (1) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Topics vary with instructor. Enrollment restrictions apply. (F,SP)

Upper Division Courses

100. Communicating Chemistry. (2) Course may be repeated for credit. Two hours of lecture and one hour of fieldwork per week. Formerly 20. For under-

graduate and graduate students interested in improving their ability to communicate their scientific knowledge by teaching chemistry in elementary schools. The course will combine instruction in inquiry-based chemistry teaching methods and learning pedagogy with 10 weeks of supervised teaching experience in a local school classroom. Thus, students will practice communicating chemistry and receive mentoring on how to improve their presentations. Approximately three hours per week, including time spent in school classrooms. (SP)

103. Inorganic Chemistry in Living Systems. (3) Three hours of lecture per week. Prerequisites: 1B or 1C. Prerequisites: Introduction to inorganic chemistry applied to the study of biological systems. (F)

104A-104B. Advanced Inorganic Chemistry. (3,3) Three hours of lecture per week. Prerequisites: 1B, 4A, or 3A; 104A is required to 104B. The chemistry of metals and nonmetals including the application of physical chemical principles. (F,SP)

105. Instrumental Methods in Analytical Chemistry. (4) Two hours of lecture and eight hours of laboratory per week. Prerequisites: 4B or 1B and 15 or 1AL; 3B or 112B recommended. Techniques, instrumentation and analytical applications of atomic spectroscopies, mass spectrometry, separations, electrochemistry and micro-characterization. Discussion of instrumental bases as well as real-world problem solving with an emphasis on bioanalytical, environmental, and forensic applications. Hands-on laboratory work using modern instrumentation, emphasizing independent projects involving real-life sample analyses. (F,SP)

108. Inorganic Synthesis and Reactions. (4) Two hours of lecture and eight hours of laboratory per week. Prerequisites: 4B or 15; 104B with grade of C- or higher, or 103. The preparation of inorganic compounds by vacuum line, air- and moisture-exclusion, electrochemical, high-pressure, and other synthetic techniques. Kinetic and mechanistic studies of inorganic compounds. (F,SP)

112A-112B. Organic Chemistry. (5,5) Students will receive no credit for 112A after taking 3A and 3AL. Three hours of lecture, one hour of laboratory discussion, and five hours of laboratory per week. Prerequisites: 12B or 4B with grade of C- or higher; 112B: 112A with grade of C- or higher. For students planning to major in chemistry or chemical engineering, it is recommended that they take 112A with a minimum grade of B- or consent of instructor. Advanced topics in organic chemistry including fundamental concepts and general principles, such as chemical engineering and molecular and cell biology. A study of all aspects of fundamental organic chemistry, including nomenclature, chemical and physical properties, reactions of the major classes of organic compounds. The study includes theoretical aspects, reaction mechanisms, multistep syntheses, and the chemistry of polycyclic and heterocyclic compounds. The course is more extensive and intensive than 3A-3B and includes a greater emphasis on reaction mechanisms and multi-step syntheses. 112A (F); 112B (SP)

113. Advanced Mechanistic Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: 3B or 112B with a minimum grade of B- or consent of instructor. Advanced topics in mechanistic and physical organic chemistry typically including kinetics, reaction intermediates, substituent reactions, linear free energy relationships, orbital interactions, and orbital symmetry control of reactions, isotope effects, and photochemistry. (SP)

114. Advanced Synthetic Organic Chemistry. (3) Three hours of lecture per week. Prerequisites: 3B or 112B with a minimum grade of B- or consent of instructor. Advanced topics in synthetic organic chemistry with a focus on selectivity. Topics include reduction, oxidation, enolate chemistry and the aldol reaction, reactions of non-stabilized anions, olefination reactions, and the chemistry of metal complexes of carbon and nitrogen, and applications to the synthesis of complex structures. (SP)

115. Organic Chemistry—Advanced Laboratory Methods. (4) One hour of lecture and 11 hours of laboratory per week. Prerequisites: 112B with a grade of C- or higher. Advanced synthetic methods, chemical and spectroscopic structural methods, designed as a preparation for experimental research. (SP)

120A. Physical Chemistry. (3) Students will receive two units of credit for 120A after taking 130B. Three hours of lecture per week. Prerequisites: 4B or equivalent, Math- ematics 7B or 8B. Statistical mechanics, thermodynamics, equilibrium and applications to chemical systems: states of matter, solutions and solvation, chemical kinetics, molecular dynamics, and molecular transport. (F,SP)

120B. Physical Chemistry. (3) Three hours of lecture per week. Prerequisites: 4B or equivalent; Mathematics 7B or 8B. Statistical mechanics, thermodynamics, equilibrium and applications to chemical systems: states of matter, solutions and solvation, chemical kinetics, molecular dynamics, and molecular transport. (F,SP)

122. Quantum Mechanics and Spectroscopy. (3) Three hours of lecture per week. Prerequisites: 120A. Postulates and methods of quantum mechanics and group theory applied to molecular structure and spectra. (F)

125. Physical Chemistry Laboratory. (3) Students will receive 1 unit of credit for 125 after taking C182 or Earth and Planetary Science C182. Consent of instructor is required to enroll in 125 after completing C182 or EPS C182. One hour of lecture and five hours of laboratory per week. Prerequisites: Two of the following: 120A, 120B, C130, or 130B with grades of C- or higher (one of which may be taken concurrently). Experiments in thermodynamics, kinetics, molecular structure and general physical chemistry. (F,SP)

C130. Biophysical Chemistry: Physical Principles and the Molecules of Life. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 3A or 112A, Mathematics 1A, Biology 1A and 1AL, 3B or 112B recommended. Thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biomolecules (proteins, DNA, and RNA). Molecular distributions, reaction kinetics, enzyme kinetics. Bioenergetics, energy transduction, and motor proteins. Electrochemical potential, membranes, and ion channels. Also listed as Molecular and Cell Biology C100A. (F,SP)

130B. Biophysical Chemistry. (3) Students will receive no credit for 130B after taking both 120A and 120B and students will receive no credit for 130B after taking either 120A or 120B. Two hours of lecture and one hour of discussion per week. Prerequisites: C130 or Molecular and Cell Biology C100A, or consent of instructor. The course will cover discussion of the physical chemistry of macromolecules, intermolecular forces and interactions, biomolecular spectroscopy, high-resolution structure determination. (SP)

135. Chemical Biology. (3) Students will receive no credit for 135 after taking Molecular and Cell Biology 100B or 102. Three hours of lecture per week. Prerequisites: 3B or 112B; Biology 1A; or consent of instructor. One-quarter introduction to biochemical chemistry, aimed toward chemical and chemical biology majors. (F,SP)

143. Nuclear Chemistry. (2) Two hours of lecture per week. Prerequisites: Physics 7B or equivalent. Radioactivity, fission, nuclear models and reactions, nuclear radiations and processes in nature. Computer methods will be introduced. (F)

146. Chemical Methods in Nuclear Technology. (3) One and one-half hours of lecture and four and one-half hours of laboratory per week. Prerequisites: 4B or 15; 143 is recommended. Experimental and theoretical methods for the detection and analysis of the isotopic composition of the nuclear science and technology; fission process, chemistry of fission fragments, chemical effects of nuclear transformation; application of radioactivity to study of chemical problems; neutron activation analysis. (SP)
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149. Supplementary Work in Upper Division Chemistry. (1-4) Course may be repeated for credit. Meet-
ings to be arranged. Students with partial credit in upper division courses may, with consent of instructor, complete the credit under this heading. (F,SP)

C150. Introduction to Materials Chemistry. (3) Three hours of lecture per week. Prerequisites: 104A; 104B is recommended. The application of basic chemical principles to problems in materials discovery, design, and characterization will be discussed. Topics covered include inorganic solids, nanomaterials, polymers, and biological materials, with specific focus on catalytic and clean energy. This course will elucidate the bulk properties of matter. Also listed as Materials Science and Engineering C150. (SP) Staff

C170L. Biochemical Engineering Laboratory. (3) Six hours of laboratory and one hour of lecture per week. Prerequisites: Chemical Engineering 170A (may be taken concurrently) or consent of instructor. Labo-

ratory techniques for the cultivation of microorgan-

isms in batch and continuous reactions. Enzymatic conversion processes. Recovery of biological prod-

ucts. Also listed as Chemical Engineering C170L. (F)

C178. Polymer Science and Technology. (3) Three hours of lecture and three hours of laboratory per week. An interdisciplinary course on the synthesis, characterization, and properties of polymer materials. Emphasis will be on the molecular origin of properties of poly-

meric materials and technological applications. Topics include single molecule properties, polymer mixtures and solutions, melts, glasses, elastomers, and crystals. Experiments in polymer synthesis, characterization, and physical properties are listed as Chemical Engi-

neering C178. (F,SP) Segalman

C182. Atmospheric Chemistry and Physics Lab-

oratory. (3) Students will receive one unit of credit for C182 after taking 125. One hour of lecture and five hours of laboratory per week. Prerequisites: Earth and Planetary Science 50 and 102 with grades of C- or higher (one of which may be taken concurrently) or two of the following: Chemistry 120A, 120B, C130, or 130B with grades of C- or higher (one of which may be taken concurrently). Fluid dynamics, radiative transfer, and the kinetics, spectroscopy, and measurement of atmospherically relevant species are explored through laboratory experiments, numerical simulations, and field observations. Also listed as Earth and Planetary Science C182. (SP)

C191. Quantum Information Science and Tech-

nology. (3) Three hours of lecture/discussion per week. Prerequisites: Mathematics 54, Physics 7A-7B, and either Mathematics S5, or Computer Science 170. This multidisciplinary course provides an introduction to fundamental conceptual aspects of quantum mechanics from a computational and infor-

mational perspective, as well as physical implementations and technological applications of quantum information science. Basic sections of quan-

tum algorithms, complexity, and cryptography will be touched upon, as well as pertinent physical realiza-

tions from nanoscale science and engineering. Also listed as Physics C191 and Computer Science C191. (F,SP) Crommie, Vazinani, Whaley

192. Individual Study for Advanced Undergradu-

ates. (1-3) Course may be repeated for credit. Indi-

vidual contracts must be submitted for each credit. Consent of instructor and adviser. All properly qualified students who wish to pursue a problem of their own choice, through read-

ing or non-laboratory study, may do so if their proposed program is approved by the member of the staff with whom they wish to work. (F,SP)

H194. Research for Advanced Undergraduates. (2-4) Course may be repeated for credit. Minimum of three hours of work per week per unit of credit. Prere-

quisites: Minimum GPA of 3.4 overall at Berkeley and consent of instructor and adviser. Students may pursue original research under the direction of one of the members of the staff. (F,SP)

195. Special Topics. (3) Course may be repeated for credit. Three hours of lecture per week. Prere-

quisites: Consent of instructor. Special topics will be offered from time to time. Examples are photochemi-

cal air pollution, computers in chemistry.

196. Special Laboratory Study. (2-4) Course may be repeated for credit. Laboratory. Prerequisites: Con-

sent of instructor and adviser. Special laboratory work for advanced undergraduates. (F,SP)

197. Field Study in Chemistry. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience in off-campus organizations relevant to specific aspects and appli-

cations of chemistry. Written report required at the end of the term. Course does not satisfy unit or resi-

dence requirements for the bachelor's degree. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One hour of lecture per week per unit. Must be taken on a passed/not passed basis. Pre-

erequisites: Completion of 60 units of undergraduate study and in good standing. Group study of selected topics. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Nominated study only. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations listed in this catalog. (F,SP)

Graduate Courses

200. Chemistry Fundamentals. (1) Three hours of lecture per week for five weeks. Prerequisites: Grad-

uate standing or consent of instructor. Review of bond-

ing, structure, stereochemistry, conformation, thermodynamics and kinetics, and arrow-pushing formalisms. (F)

201. Fundamentals of Inorganic Chemistry. (1) Three hours of lecture per week for five weeks. Pre-

requisites: Graduate standing or consent of instructor. Introduction to bonding, structure, MO theory, thermo-

dynamics, and kinetics. (F)

208. Structure Analysis by X-Ray Diffraction. (4) Three hours of lecture and eight hours of laboratory per week. Prerequisites: Consent of instructor. The theory and practice of modern, single-crystal X-ray diffraction. Groups of four students determine the crystal and molecular structure of newly synthesized materials from the College of Chemistry. This labora-
tory work involves the mounting of crystals and initial evaluation by X-ray diffraction film techniques, the collection of intensity data by automated diffrac-
tometer procedures, and structure analysis and refinement. (F)

220A. Thermodynamics and Statistical Mechan-

ics. (3) Three hours of lecture per week. Prerequi-

sites: 120B. A rigorous presentation of classical thermodynamics followed by an introduction to statistical mechanics with the application to real systems. (SP)

220B. Statistical Mechanics. (3) Three hours of lecture per week. Prerequisites: 220A. Principles of statistical mechanics and applications to complex systems. (F)

221A. Advanced Quantum Mechanics. (3) Three hours of lecture per week. Prerequisites: 221B and 122 or equivalent. Introduction, one-dimensional prob-

lems, matrix mechanics, approximation methods. (F)

221B. Advanced Quantum Mechanics. (3) Three hours of lecture per week. Prerequisites: 221A. Time dependence, interaction of matter with radiation, scat-

tering theory. Molecular and many-particle quantum mechanics. (SP)

222. Spectroscopy. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course presents a survey of exper-

imental and theoretical methods of spectroscopy, and group theory as used in modern chemical physics. The course topics include experimental methods, clas-

tical and quantum descriptions of the interaction of radiation and matter. Qualitative and quantitative aspects of the subject are illustrated with examples of application of linear and nonlinear spectro-

oscopies to the study of molecular structure and dynam-

ics and to quantitative analysis. This course is offered jointly with 122. (SP)

223A. Chemical Kinetics. (3) Three hours of lecture per week. Prerequisites: 220A (may be taken con-

currently) or consent of instructor. Topics in kinetics and the integration of this new knowledge into society, policymaking, and business. Green chemistry is an intellectual framework created to meet these challenges and guide technological development. It encourages the design and production of safer and more sustainable chemicals and products. Also listed as Public Health C234 and Environ Sci, Policy, and Management C234. (SP) Staff

223C. Green Chemistry: An Interdisciplinary Approach to Sustainability. (3) Three hours of lec-
ture per week. Prerequisites: One year of chemistry, including a semester of organic chemistry. Meeting the challenge of global sustainability will require inter-
disciplinary approaches to research and education, as well as the integration of this new knowledge into society, policymaking, and business. Green chemistry is an intellectual framework created to meet these challenges and guide technological development. It encourages the design and production of safer and more sustainable chemicals and products. Also listed as Public Health C234 and Environ Sci, Policy, and Management C234. (SP) Staff

243. Advanced Nuclear Structure and Reactions. (3) Three hours of lecture per week. Prerequisites: 143 or equivalent and introductory quantum mechan-

ics. Selected topics on nuclear structure and nuclear reactions. (F)

250A. Introduction to Bonding Theory. (1) Three hours of lecture per week for five weeks. Prerequi-

sites: 200 or 201 or consent of instructor and back-
ground in the use of matrices and linear algebra. An introduction to group theory, symmetry, and repre-
sentations as applied to chemical bonding. (F)

250B. Inorganic Spectroscopy. (3) Three hours of lecture per week for five weeks. Prerequisites: 250A or consent of instructor. The theory of vibrational analysis and spectroscopy as applied to inorganic compounds. (SP)

251A. Coordination Chemistry I. (1) Three hours of lecture per week for five weeks. Prerequisites: 250A or consent of instructor. Introduction to organo-

metallics, focusing on structure, bonding, and reactivity. (F)

251B. Coordination Chemistry II. (1) Three hours of lecture per week for five weeks. Prerequisites: 251A or consent of instructor. Synthesis, structure analysis, and reactivity patterns in transition metal complexes. (SP)

252A. Organometallic Chemistry I. (1) Three hours of lecture per week for five weeks. Prerequisites: 250A or consent of instructor. An introduction to organometallics, focusing on structure, bonding, and reactivity. (F)

252B. Organometallic Chemistry II. (1) Three hours of lecture per week for five weeks. Prerequisites: 252A

or consent of instructor. Applications of organometallic compounds in synthesis with an emphasis on catalysis. (F)  

253A. Materials Chemistry I. (1) Three hours of lecture per week for five weeks. Prerequisites: 200 or 201 and consent of instructor. Introduction to the descriptive crystal chemistry and electronic band structures of extended solids. (SP)  

253B. Materials Chemistry II. (1) Three hours of lecture per week for five weeks. Prerequisites: 253A or consent of instructor. Solid state synthesis and characterization techniques as well as a survey of important physical phenomena, including optical, electrical, and magnetic properties. (SP)  

253C. Materials Chemistry III. (1) Three hours of lecture for five weeks. Prerequisites: 253A or consent of instructor. Introduction to surface catalysis, organic solids, and nanoscience. Thermodynamics and kinetics of solid state diffusion and reaction will be covered. (SP) Somorjai, Yang  

254. Bioinorganic Chemistry. (1) Three hours of lecture per week for five weeks. A survey of the roles of metals in biology, taught as a tutorial involving class presentations. (SP)  

256. Electrochemical Methods. (1) Three hours of lecture per week for five weeks. The effect of structure and kinetics on the appearance of cyclic voltammograms and the use of cyclic voltammetry to probe the thermodynamics, kinetics, and mechanisms of electrochemical reactions. (SP)  

260. Reaction Mechanisms. (2) Three hours of lecture and in-class discussion and problem solving for ten weeks, and one week of computer laboratory. Prerequisites: 260A or 260B. Advanced methods for studying organic reaction mechanisms. Topics include kinetic isotope effects, behavior of reactive intermediates, chain reactions, competition between aromatic and antiaromatic, electronic and steric effects, free energy relationships, photochemistry. (F)  

261A. Organics I. (1) Three hours of lecture per week for five weeks. Prerequisites: 200 or 201 and consent of instructor. Features of the reactions that comprise the vocabulary of synthetic organic chemistry. (F)  

261B. Organic Reaction II. (1) Three hours of lecture per week for five weeks. Prerequisites: 261A or consent of instructor. More reactions that are useful to the practice of synthetic organic chemistry. (F)  

261C. Organic Reactions III. (1) Three hours of lecture per week for five weeks. Prerequisites: 261B or consent of instructor. This course will consider further reactions with an emphasis on pericyclic reactions such as cycloadditions, electrocyclic closures, and sigmatropic shifts. (SP)  

262. Metals in Organic Synthesis. (1) Three hours of lecture per week for five weeks. Prerequisites: 261B or consent of instructor. Transition metal-mediated reactions occupy a central role in asymmetric catalysis and the synthesis of complex molecules. This course will develop a few of the general principles of transition metal reactivity, coordination chemistry, and stereoselection. This module will also emphasize useful methods for the analysis of these reactions. (SP)  

263A. Synthetic Design I. (1) Three hours of lecture per week for five weeks. Prerequisites: 262 or consent of instructor. This course will describe the application of modern reactions to the total synthesis of complex target molecules. Natural products such as alkaloids, terpenes, or polypropionates, as well as theoretically interesting “non-natural” molecules, will be covered. (SP)  

263B. Synthetic Design II. (1) Three hours of lecture per week for five weeks. Prerequisites: 263A or consent of instructor. The principles of retrosynthetic analysis, including known and the chemistry of protecting groups will be discussed. Special attention will be given to the automated synthesis of biopolymers such as carbohydrates, peptides, and proteins, as well as nucleic acids. (SP)  

265. Nuclear Magnetic Resonance Theory and Application. (1) Three hours of lecture per week for five weeks. Prerequisites: 200 or 201 and consent of instructor. The course will cover basic principles of magnetic resonance spectroscopy and a survey of its applications to chemical structure. (SP)  

268. Mass Spectrometry. (2) Students will receive 1 unit of credit for 268 after taking 266. Three hours of lecture for 10 weeks. Prerequisites: Graduate standing and consent of instructor. Theory and application in mass spectrometry, including ionization methods, mass analyzers, spectral interpretation, multidimensional methods (GC/MS, HPLC/MS, MS/MS), with emphasis on organic and biological applications (proteins, peptides, nuclei acids, carbohydrates, noncovalent complexes); this will include the opportunity to be trained and check out several open-access mass spectrometers. (SP)  

270A. Advanced Biophysical Chemistry I. (1) Two hours of lecture for seven and one-half weeks. Prerequisites: 200 or consent of instructor. Underlying principles and applications of methods for biophysical analysis of biological macromolecules. (F)  

270B. Advanced Biophysical Chemistry II. (1) Three hours of lecture for seven and one-half weeks. Prerequisites: 270A or consent of instructor. More applications of methods for biophysical analysis of biological macromolecules. (F)  

271A. Chemical Biology I—Structure, Synthesis, and Function of Biomolecules. (1) Three hours of lecture per week for five weeks. Prerequisites: 200 or consent of instructor. This course will present the structure of proteins, nucleic acids, and oligosaccharides from the perspective of organic chemistry. Modern methods for the synthesis and purification of these molecules will also be presented. (SP)  

271B. Chemical Biology II—Enzyme Reaction Mechanisms. (1) Three hours of lecture per week for five weeks. Prerequisites: 271A or consent of instructor. The course will begin with an introduction to the general concepts of enzyme catalysis which will be followed by detailed examples that will examine the chemistry behind the reactions and the three-dimensional structures that carry out the transformations. Also listed as Molecular and Cell Biology C212A. (SP)  

271C. Chemical Biology III—Contemporary Topics in Chemical Biology. (1) Three hours of lecture per week for five weeks. Prerequisites: 271B or consent of instructor. This course will continue to discuss in Chemical Biology I and II. The focus will consist of case studies where rigorous chemical approaches have been brought to bear on biological problems. Course topics will include signal transduction, photosynthesis, immunology, virology, and cancer. For each topic, the appropriate biophysical techniques will be emphasized. (SP)  

272A. Bio X-Ray I. (1) Three hours of lecture per week for five weeks. Prerequisites: 272A or consent of instructor. Theory and application of X-ray crystallography to biomacromolecules. (SP)  

272B. Bio X-Ray II. (1) Three hours of lecture per week for five weeks. Prerequisites: 272A or consent of instructor. More sophisticated aspects of the application of X-ray crystallography to biomacromolecules. (SP)  

273A. Bio NMR I. (1) Two hours of lecture for seven and one-half weeks. Prerequisites: 270A-270B or consent of instructor. Fundamentals of multidimensional NMR spectroscopy (including use of the density matrix for analysis of spin response to pulse sequences) and applications of multidimensional NMR in probing structure, interactions, and dynamics of biological molecules will be described. (SP)  

273B. Bio NMR II. (1) Two hours of lecture for seven and one-half weeks. Prerequisites: 272A. Triple resonance methods for determination of protein and nucleic acid resonance assignments, and for generation of structural restraints (distances, angles, H-bonds, etc.). Methods for calculating conformations from NMR data and the quality of such structures will be discussed. (F,SP)  

295. Special Topics. (1-3) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Lecture and term interest. Recently offered topics: natural products synthesis, molecular dynamics, statistical mechanics, molecular spectroscopy, structural biology, organic synthesis, and bioorganic chemistry. (F,SP)  

298. Seminars for Graduate Students. (1-3) Course may be repeated for credit. Seminars. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. In addition to the weekly Graduate Research Conference and weekly seminars on topics of interest in biophysical, organic, physical, nuclear, and inorganic chemistry, there are group seminars. (F,SP)  

299. Research for Graduate Students. (1-9) Course may be repeated for credit. Laboratory. Prerequisites: Graduate standing. The facilities of the laboratory are available at all times to graduate students pursuing original research investigations toward an advanced degree at this university. Such work is ordinarily in collaboration with a member of the staff. (F,SP)  

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. degree. May not be used for unit or residence requirements for the doctoral degree. (F,SP)  

Professional Courses  

300. Professional Preparation: Supervised Teaching of Chemistry. (2) Course may be repeated for credit. Prerequisites: Graduate standing and appointment as a graduate student instructor. Discussion, supervision, evaluation, observation, and practice teaching in chemistry. (F,SP)  

301. Pre-High School Chemistry Classroom Immersion. (1) Course may be repeated for credit. One hour of lecture per week (average). Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduation and eligibility to participate. Provides training and opportunity for graduate students to make presentations in local public
The Minor in Chicano Studies

Requirements. Completion of five courses from Chicano Studies 101, 110, 130, 133, 135, 141, 142, 143, 145, 148, 150A, 150B, 159, 161, 172, 174, 176, 179, 180. Students may also use one approved course from another department or EAP.

Lower Division Courses

20. Introduction to Chicano Culture. (4) Three hours of lecture per week. An introduction to the cultural life of Chicanos with its regional differences. Key themes are the symbols and culture that are the historical interaction between Chicanos and American society as expressed in literature, art, music, and folklore. Attention will also be given to change and continuity in Chicano cultural norms on the basis of historical events. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP) Staff 

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer upper-division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

40. Introduction to Chicano Literature in English. (4) Four hours of lecture per week. The course will introduce students to modern Chicano literature written in English, and will provide necessary background for understanding more specialized courses in the area. (SP) Perez

70. Latino Politics. (4) Three hours of lecture and one hour of discussion per week. A critical analysis of the Latino political experience in the United States. The course compares and contrasts the ideologies, political organizations, and political leadership in the Mexican American, Cuban American, Puerto Rican, and Central American communities. The contemporary issues confronting Latinos are critically examined. (F,SP) Staff

Field Study in Chicano Studies. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Open to freshmen and sophomores only. Supervised independent field experience in the community relevant to specific aspects of Chicano studies. (F,SP) Staff

Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Open to freshmen and sophomores only. Group study of selected topics which will vary from semester to semester. (F,SP) Staff

Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three to twelve hours of tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Individual research by lower division students. Limited to freshmen and sophomores. (F,SP) Upper Division Courses

101. Paradigms in Chicano Studies. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Majors and minors only. A critical assessment of paradigms and intellectual traditions in Chicano studies. (F,SP)
110. Latino/o Philosophy and Religious Thought. (4) Three hours of lecture per week. For the last 30 years, the themes of identity and liberation have dominated Latino/o philosophy and religious thought. This course will examine major themes of Latino/o philosophy in the context of Latino/o political movements. (F,SP)

130. Mexican and Chicano Art History. (3) Three hours of lecture per week. Formerly 30. A survey of Mexican and Chicano art from Mesoamerican period to the contemporary Chicano art. Special focus on the mural movements and the relationship between artistic production and the development of Chicano symbols and cultural production. (F,SP)

133. Chicana/o Music. (4) Three hours of seminar per week. What is Chicana/o music? When did it begin? Who are considered Chicano musicians? How has Chicano music changed in relationship to the historical changes in the Chicano community? How has Chicano music helped shaped and been shaped by political, social, and cultural history? How has Chicano music been a music accommodation and/or resistance? What role have Chicano artists/musicians played as cultural workers? Does Chicano music have a place in Chicano art and Chicano culture? (F,SP)

135A. Latino Narrative Film to the 1980s. (4) Students will receive 2 units for 135A after taking 135B. Three hours of lecture per week. The course examines narrative films primarily from the 1970s and 1980s that deal with the Latino/Latina experience and the influences that shaped the views reflected in those cinematic works. Films produced in the United States and in Latin America will be encompassed in the course, as well as experimental and independent productions. (F,SP) Staff

135B. Latino Narrative Film Since 1990. (4) Students will receive 3 units for 135B taken on a pass/no pass basis. Three hours of lecture per week. This course examines narrative films produced since the 1980s that deal with the Latino/Latina experience and the influences that shaped the views reflected in those cinematic works. Films produced in the United States and in Latin America will be encompassed in the course. (F,SP) Staff

135C. Latino Documentary Film. (4) Three hours of lecture per week. This course examines documentary films that are Latino-produced and/or Latino-based in content. The course will emphasize documentary film analysis and interpretation, taking into account the influences of both U.S. and Latin American cinema; alternative media, docudrama, podcasts, and the like will also be discussed. (F,SP) Staff

141. Chicana Feminist Writers and Discourse. (4) Four hours of lecture per week. Prerequisites: 40. A critical and theoretical analysis of contemporary Chicana writers and Chicana feminist discourse. (F,SP) Staff

142. Major Chicana Writers. (4) Three hours of lecture per week. Prerequisites: 40. Critical analysis of the works of major Chicana playwrights, poets, and fiction writers. (F,SP) Staff

143. Chicano and Latin American Literature. (3) Three hours of lecture per week. Prerequisites: 40 recommended. The relationships and parallel aspects between Latin American and Chicano literature. Emphasis on the literature of protest as a constant underlying current from the Conquest to the present. (F,SP) Staff

145. Contemporary Issues of Chicanas. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 50 required; 40 or 20 recommended. This course focuses on contemporary issues facing Chicanas in the United States. The scope is historical-structural and examines political, and economic arrangements resulting in race-, class-, and gender-based inequities. An individual and community scope examines the variations of: (1) class, racial/ethnic, and gender identity; (2) social integration; and (3) responses to structural barriers. (F,SP)

148. Chicano/Latino Theatre Workshop. (5) Course may be repeated for credit. Four hours of lecture and two hours of laboratory. Prerequisites: Reading and Composition or consent of instructor. Survey of Chicano/Latino Theatre from the 1960s to the present. Students will be introduced to various aspects of Chicano/Latino theatre production with particular emphasis on playwriting and development. Plays will be studied within their social and historical context. (F,SP)

149. Creative Writing. (5) Three hours of lecture and three hours of workshop per week. Prerequisites: 40 and consent of instructor. The student enrolled will study intensively craft in Chicano literature, issues and problems encountered by Chicano writers and the role of the Chicano artist in society. The student will also practice writing in the genre of the student’s choice. (F,SP)

150A. History of the Southwest: Spanish and Mexican Period. (4) Three hours of lecture per week. Prerequisites: 50 recommended. The role of people of Mexican descent in the Southwest from 1800 to 1880. (F) Saragoza

150B. History of the Southwest: Mexican-United States War to Present. (4) Three hours of lecture per week. Prerequisites: 50 and/or 150A recommended. The relationship between people of Mexican descent and American society from 1880 to the present. (SP) Saragoza

159. Mexican Immigration. (4) Three hours of lecture per week. Prerequisites: 50 recommended. An examination of the historical and contemporary migration of Mexican immigrants to the United States. The relationship between immigration and Chicano community formation will be examined. Issues addressed include settlement patterns, socialization, educational aspiration, identity transformation, and historical changes. (F,SP)

161. Central American Peoples and Cultures. (4) Three hours of lecture per week. A comparative survey of the peoples and cultures of central America with particular emphasis on the historical and contemporary perspective. (F,SP) Manz

C161. Central American Peoples and Cultures. (4) Three hours of lecture per week. A comparative survey of the peoples and cultures of the seven countries of the Central American Isthmus from a historical and contemporary perspective. Also listed as Geography 157. Manz

162. The U.S. Role in Central America. (4) Three hours of lecture and one hour of discussion per week. A critical examination of the role played by the United States in Central America from the 19th century to the present. The focus will be on trends in U.S. policy, including an assessment of current policy alternatives in Nicaragua, El Salvador, Guatemala, Honduras, and the impact of the United States War in Latin America. (F,SP) Manz

163. Caribbean Migration to Western Europe and the United States. (4) Three hours of seminar per week. The main goal of this course is to offer a broad and comprehensive understanding of Caribbean migrant experience to the United States. We will cover crucial issues such as the migration origins, modes of incorporation, racism, cultural/identity strategies, and the political-economic relationship between the Caribbean and the United States. (F,SP) Staff

165. Cuba, the United States, and Cuban Americans. (4) Three hours of lecture and one hour of discussion per week. This course examines the contested role of Cuban identity and the intersections of race and the relationship to the United States have constituted fundamental issues in the debate over the meaning of Cubandad. The course will address the ways in which Cuba defined race and national identity after the Revolution of 1959 as well as for the Cuban emigre community in the United States. Issues of gender, class, and cultural expression will be seen as the basis for elements of analysis throughout the course. (F,SP)

172. Chicanos and the Educational System. (4) Three hours of lecture per week. Prerequisites: 70 recommended. An examination of the historical and contemporary relationship between the educational system and the Mexican community in the United States; the history of schooling practices within the Mexican population as a backdrop to an examination of the current educational conditions of the Chicano student; the different historical trends in the education of Chicanos including alternative schools, bilingual education, school segregation, and higher education. (F,SP)

174. Chicanos, Law, and Criminal Justice. (4) Three hours of lecture per week. Prerequisites: 70 recommended. An examination of the development and function of law, the organization and administration of criminal justice, and their effects in the Chicano community; response to these institutions by Chicanos. (F)

175. Chicanos and Health Care. (3) Three hours of lecture per week. Prerequisites: 70 recommended. Relationship of the health care delivery system in the United States to the Chicano community. To include an examination and understanding of the concept of mental health as defined by Chicanos. Analysis of program alternatives and the Chicano response to health care problems and issues. (F,SP)

176. Chicanos/Latinas Families. (4) Three hours of lecture and one hour of discussion per week. This course provides an overview of Chicano family structures, using historical, Chicano, and feminist perspectives for analysis of familial patterns. Special attention is given to the use of traditional-cultural explanations of household gender relations, extended families, and Chicano communities. (F,SP)

180. Topics in Chicano Studies. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Designed primarily to permit instructors to deal with topics which they are especially concerned; usually more restricted than the subject matter of a regular lecture course. (F,SP)

195. Senior Thesis. (4) By arrangement. Prerequisites: Consent of instructor. Writing of a thesis under the direction of the member(s) of the faculty. (F,SP) Staff

H195A-H195B. Honors Thesis. (3;3) Hours to be arranged. Credit and grade to be awarded on completion of sequence. Prerequisites: Junior standing; a 3.3 University GPA and a 3.3 GPA in the major. Independent study and preparation of an honor thesis under the supervision of the member(s) of the faculty. (F,SP) Staff

197. Field Work in Chicano Studies. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Individual arrangements. Must be taken on a pass/not passed basis. Prerequisites: Upper division standing; consent of instructor. Supervised independent field experience in the community relevant to specific aspects of Chicano studies. Regular meetings with faculty sponsor and written reports required. (F-SP) Staff

198. Directed Group Study. (1-3) Course may be repeated for credit. Individual arrangements. Must be taken on a pass/not passed basis. Prerequisites: Upper division standing; consent of instructor. Directed group study in Chicano studies for advanced students. (F-SP) Staff
The Profession

City and regional planners seek to make a difference in the future. The profession of city planning was born in the 19th century to deal with the problems of fast-growing industrial cities. Since then, city planning has expanded to include social reform, physical planning and urban design, housing and community development, transportation and infrastructure systems, urban and regional economic development, the natural and metropolitan environment, historic preservation, sustainable development, geographic information systems, comparative urban development, urban management, and, of course, land use planning. Graduates of city planning programs work in cities, metropolitan, and state planning offices; for private, nonprofit, and community developers; for environmental organizations; in consulting firms and research institutions; in international development agencies; and for many public and private enterprises. All are dedicated to using their personal and professional skills and abilities to produce better, more livable, and more equitable communities.

Undergraduate Program

Urban Studies Major. The undergraduate major in urban studies introduces interested students to cities and urban environments as objects of study, analysis, criticism, and planned transformation. The major has a core in urban studies and planning with courses in city planning and environmental design, and an interdisciplinary curriculum in various urban-related social science fields and disciplines.

City and Regional Planning Minor. The Department of City and Regional Planning offers an interdisciplinary minor in city planning that is open to students who are not city planning majors. Students in the study and analysis of urban environments and teaches them about the practices, policies, and politics that constitute the field of urban planning.

Graduate Programs

The Master of City Planning Degree. The two-year Master of City Planning (M.C.P.) program comprises a solid core of knowledge in the field of city and regional planning—including history and theory, planning methods, urban economics, and urban institutions analysis—and an opportunity to specialize in one of five concentration areas (or to create a self-defined emphasis): housing, community, and economic development; environmental planning and policy; land use planning; transportation policy and planning; and urban design. M.C.P. students can also combine one or more concentrations with one of three fields: international and comparative planning, GIS and spatial analysis, or metropolitan/regional planning.

The M.C.P. degree requires the completion of 48 units of coursework during four semesters in residence. Unless they already have equivalent work experience, students must also complete a three-month internship. The terminal M.C.P. requirement, undertaken during the second year of study, takes the form of a professional report or a client report. Alternatively, some elect to write a master’s thesis. The Department of City and Regional Planning participates in concurrent master’s degree programs with the Departments of Architecture, Landscape Architecture and Environmental Planning, Civil and Environmental Engineering, and Public Health; and with UC Berkeley School of Law, UC Hastings College of the Law, and International and Area Studies.

The Doctor of Philosophy Degree in City and Regional Planning. The Ph.D. program aims to prepare students interested in cities, regions, and planning for careers in teaching, research, and advanced practice. The program stresses preparation in research methods, spatial and regional analysis, methods of the policy sciences, development theory, historical processes, and the critical appraisal of alternative courses of urban and metropolitan change.

Each student’s program of study is individually designed with the assistance and support of an advisor, in accordance with the student’s specific academic interests and prior preparation. Ph.D. students are required to complete an outside field requirement (in another department) and an inside field requirement in city and regional planning during their oral exams and undertaking their dissertation research. The normal time in the program is four to five years.

Lower Division Courses

97. Field Studies in City and Regional Planning. (1-3) Course may be repeated for credit. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Group studies developed to meet specific needs of students.

Upper Division Courses

911. Introduction to City Planning. (3) Three hours of lecture/discussion per week. Introduces students to courses and departments in the study of off-campus organizations relevant to specific aspects of city planning. Regular individual meetings with faculty sponsor and written report required.

98. Special Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the chart for courses and departments. Must be taken on a passed/not passed basis. Group studies developed to meet specific needs of students.

101. Introduction to City Planning. (3) Three hours of lecture/discussion per week. Introduction to the subject of city planning, including basic economic, social, and political principles. 34 credits. (Pass/No Pass). 20 credits.

110. Urban Planning Process. (4) Three hours of lecture/discussion per week. Three hours of lecture per week. This course introduces students to the processes involved in urban planning, including decision-making, policy development, and implementation. Prerequisites: Open to majors in all fields. (SP) Prerequisites: Open to majors in all fields. (Pass/No Pass) 20 credits.

111. Community and Economic Development. (3) Three hours of lecture/discussion per week. Introduces students to the processes involved in urban planning, including decision-making, policy development, and implementation. Prerequisites: Open to majors in all fields. (Pass/No Pass) 20 credits.

112A. Economic Analysis for Planning. (3) Three hours of lecture and one hour of discussion per week. Introduction to economic concepts and thinking as used in planning. Micro-economic theory is reviewed and critiqued. (F) Staff.

113A. Community and Economic Development. (3) Three hours of lecture/discussion per week. Three hours of lecture per week. This course introduces students to the processes involved in urban planning, including decision-making, policy development, and implementation. Prerequisites: Open to majors in all fields. (Pass/No Pass) 20 credits.

141. Introduction to Urban and Regional Transportation. (3) Three hours of lecture per week. This course is designed to introduce students to the character of public transportation systems, the methods of which they are planned and analyzed, and the dimensions of key policy issues facing decision makers. (SP) Staff.

151. Urbanization in Developing Countries. (4) Three hours of lecture and one hour of discussion per week. Three hours of lecture per week. This course covers issues of development and urbanization from the era of colonialism to the era of contemporary globalization. Themes include modernization, urban informality and poverty, transnational economies, and the role of international institutions and agencies. (SP) Roy.

161. Urban Planning Process—The Undergraduate Planning Studio. (4) Four hours of lecture/dis-
cussion per week plus fieldwork. Prerequisites: Upper division standing; 110 or consent of instructor. An intermediate course in the planning process with practice in planning commonwealth agencies. Classes typically work on developing an area or other community plan. Some lectures, extensive field and group work, oral and written presentations of findings. (SP) Eaton

118AC. The Urban Community. (4) Three hours of lecture/seminar and one hour and one discussion per week. This course looks at the idea and practice of community in cities and suburbs and at the dynamics of neighborhood and community formation. Topics include urban economic development, ethnicity and identity, residential choice behavior, the political economy of neighborhoods, planning for neighborhoods, and civic engagement. Instructors emphasize different topics depending on the instructor. This course satisfies the American Cultures requirement. (SP) Hutson

119. Planning for Sustainability. (3) Three hours of lecture/discussion per week. Prerequisites: Open to majors in all fields. This course examines how the concept of sustainable development applies to cities and urban regions and gives students insight into a variety of contemporary urban planning issues through the sustainability lens. The course combines lectures, discussions, case studies, and guest appearances by leading practitioners in Bay Area sustainability efforts. Ways to coordinate goals of environment, economy, and equity at different scales of planning and at the national, the city, the neighborhood, and the site. (F)

120. Community Planning and Public Policy for Disability. (3) Three hours of lecture per week. This course reviews what society and local communities can do in terms of policies, programs, and local planning to improve the quality of life of citizens with disabilities. Attention will be given to the economics of disability; the politics of producing change; and transportation, housing, public facilities, independent living, employment, and technology. Options will be assessed from the varying perspectives of those with disabilities and the broader society. (Dear)

140. Urban Design: City-Building and Place-Making. (3) Three hours of lecture/discussion per week. This course is concerned with the multidisciplinary field and practice of urban design. It includes a review of historical approaches to urban design and current movements in the field, as well as discussion of the elements of urban form, theories of good cityform, scales of urban design, implementation approaches, and challenges and opportunities for the discipline. Learning from cities via fieldwork is an integral part of the course. (F) Macconnalld

190. Advanced Topics in Urban Studies. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Analysis of selected topics in urban studies. Topics vary by semester. (F,SP) Staff

197. Field Studies. (1) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to three hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised experiences in the study of off-campus organizations relevant to specific aspects of city planning. Regular individual meetings with faculty and guest appearances by the instructor. (F,SP) Waddell

198. Special Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to three hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Regular meetings with faculty overseer. (F,SP)

Graduate Courses

200. History of City Planning. (3) Three hours of lecture/discussion per week. The history of city planning and the role of planning in the context of urban history. Principal focus on the evolution of North American planning practice and theory since the late 19th century; some comparative and earlier material. (F) Roy

203. Metropolitan Governance and Planning. (3) Three hours of lecture/discussion per week. This course provides introduction to the metropolis with a focus on its institutions, governance, and planning. It provides a metropolitan perspective on issues that cut across the concentrations, including housing, transportation, and equity, and it emphasizes strategies for governance of metropolitan regions in the United States and Europe. (F)

204. Analytic and Research Methods for Planners. Course may be repeated for credit as modules vary. A series of core modules in research design strategies and analytic methods for planners. Each module will run for all or for a segment of a semester and will cover a cluster of methods. Students may take sequentially up to three modules in one semester. (SP) Dowall

204A. Methods of Planning Data Analysis. (2,4) Three hours of lecture and one and one-half hours of laboratory per week. Introduction to the use of quantitative reasoning and statistical techniques to solve planning and policy problems. Course focuses on: (1) basic planning techniques for analyzing and presenting secondary data, preparing forecasts, and conducting regional economic analysis (weeks 1-8); (2) inferential statistics and sampling, as applied to planning problems (weeks 9-15). For the 2-unit option, students may take the first half of the class (weeks 1-8). (F) Chapalle, Chatman, Cervero

204B. Research Methods for Planners. (2,4) Three hours of lecture/discussion per week for 10 weeks (2 units). Three hours of lecture/discussion per week for 15 weeks (4 units). Research methods for planning, including problem definition, observation, key informants, interviewing, causal modeling, survey design and overall design of research as well as memorandums and research logs. Introduction to advanced research techniques such as chi-squared and linear regression and advanced multivariate techniques such as multiple regression (weeks 9-15). For the 2-unit option, students may take the first of the class (weeks 1-8). (F) Chapalle, Chatman, Cervero

204C. Introduction to GIS and City Planning. (4) Four hours of lecture/laboratory per week. Introduction to the principles and practical uses of geographic information systems (GIS). This course is intended for graduate students with exposure to using spreadsheets and database programs for urban and natural resource analysis, and who wish to expand their knowledge to include basic GIS concepts and applications. Prior GIS or desktop mapping experience not required. (SP) Radke

204D. Multivariate Analysis in Planning. (4) Four hours of lecture/laboratory per week. Prerequisites: 204A or equivalent. Theory and application of advanced research techniques: correlation and causality modeling of cross-sectional data. Topics include multiple regression analysis; residual analysis; weighted least squares; nonlinear models; path analysis; logistic models; and probit analysis; principal components; and factor and cluster analysis. Completion of two computer assignments, using several microcomputer statistical packages, is required. (SP) Cervero

205. Introduction to Planning and Environmental Law. (3) Three hours of lecture/discussion per week. An introduction to the American legal process and legal framework within which public policy and planning problems are addressed. The course stresses legal methodology, the basics of legal research, and the course exam decisional method. Structural analysis, administrative law, and constitutional interpretation are also covered. Case topics focus on the law of planning, property rights, land use regulation, and access to housing. (SP) Elzer

206. Planning Institutions and Organizations. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Duties and role of the physical planning agency in municipal and metropoli- tan governments; major alternative definitions of city planning; relationship of physical planning to urban development agencies; significance of city planning legislation in reorganization of local government. (SP) Christensen

207. Land and Housing Market Economics. (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent. Using microeconomics as its platform, course explores the process and pattern of land utilization from a variety of perspectives: the neighborhood, the city, and the metropolis. The approach blends real estate, descriptive urban geography, and urban history with economics. (SP) Waddell

209. Methods for Collaborative Planning: Meeting Management, Negotiation, and Consensus Building. (3) Three hours of seminar per week. A methods course in basic techniques of meeting management, negotiation, mediation, and collaborative planning for controversial issues. It deals with process design, strategies for change and leadership, and ways of building civil society. This course is designed by doing course projects focused on topics such as environmental management, community and ethnic conflict, transportation, housing development, and environmental justice, along with videos and brief lectures. (Special topics course)

213. Transportation and Land Use Planning. (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent. Examination of the interactions between transportation and land use systems; historical perspectives on transportation; character of urban system and the role of metropolitan governance; urban and metropolitan systems; and collaborative planning for controversial issues. It deals with process design, strategies for change and leadership, and ways of building civil society. This course is designed by doing course projects focused on topics such as environmental management, community and ethnic conflict, transportation, housing development, and environmental justice, along with videos and brief lectures. (Special topics course)

214. Infrastructure Planning and Policy. (3) Three hours of lecture/seminar per week. Survey of basic knowledge and technology of physical infrastructure systems: transportation, water supply, wastewater, storm water, solid waste, community energy facilities, and urban public facilities. Environmental and energy impacts of infrastructure development; centralized versus decentralized systems; case study examinations. (SP) Dowall

217. Transportation Policy and Planning. (3) Three hours of lecture/discussion per week. Prerequisites: 213, Civil Engineering 290U, or consent of instructor. Policy issues in urban transportation planning; measuring the performance of transportation systems; the transportation policy formulation process; transportation finance, pricing, and subsidy issues; energy and air quality in transportation; specialized transportation for elderly and disabled people; innovations in transportation as Civil and Environmental Engineering C290U. (SP) Dowall

218. Transportation Planning Studio. (4) Four hours of studio laboratory per week. Prerequisites: 213 or 217 or consent of instructor. Studio on applying skills of urban transportation planning. Topics vary, focusing...
219. Comparative International Topics in Transportation. (3) Three hours of lecture/discussion per week. Covers comparative planning and policy topics in urban, regional, and rural transportation that are transnational in nature. Also listed as Environmental Planning. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Formerly 240. Three hours of lecture per week. This course considers the techniques used in environmental planning and the policy framework of California and the United States to address recurrent planning problems, such as the limits of implementation in varying environmental and political contexts. (SP) Bosselmann

220. The Urban and Regional Economy. (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent. Analysis of the urban, metropolitan, and regional economy for planning. Economic base and other macro models; impact analysis and projection of changing labor force and industrial structure; economic-demographic interaction; issues in growth, income distribution, planning controls; interregional growth and population distribution issues.

223. Economic Development Planning. (3) Three hours of lecture/discussion per week. Strategy and tools for developing employment attracting investment and improving the standard of living in regional, state, and local economies. Organization of economic development activities, with a focus on current practices. Chapple

225. Workshop in Regional Analysis. (3,4) Three hours of lecture/discussion per week, plus five-week optional module. Prerequisites: 204A or 220. This course covers economic base analysis, shift-share techniques, input-output analysis, regional account- ing, impact analysis, cluster analysis, and qualitative sectoral studies. Includes an optional 1-unit applied module during the last five weeks of instruction. Chapple

227. Studies in Regional Growth and Development. (3) Three hours of seminar per week. Formerly C227. Intermediate to advanced course focusing on theory and empirical evidence for regional growth and development, using reading and discussion. Staff

228. Research Workshop on Metropolitan Regional Planning. (4) Four hours of studio and two hours of seminar per week. Prerequisites: Relevant past coursework and consent of instructor. Field problem in major phases of metropolitan or regional planning work. A collaborative student-group effort in formu- lating policy or plan recommendations within specific governmental framework. Staff

230. U.S. Housing, Planning, and Policy. (3) Three hours of lecture/discussion per week. Theory of housing markets and empirical methods for measuring market conditions, housing choice, housing turnover, housing and quality, housing affordability, housing consumption, housing supply production, and market performance. Empirical analysis and applications to policy issues. (F) Staff

231. Housing in Developing Countries. (3) Three hours of lecture/discussion per week. This course covers issues of housing policy and housing form in the urbanizing developing world from a comparative and cross-cultural perspective. Using case studies from Latin America, Asia, and the Middle East, it highlights the role of physical planners as well as the role of other actors and interest groups in the development of housing policies and urban development plans in the developing world. The course will also analyze the economic determinants of housing and land markets from the viewpoints of investors, developers, public and private managers, and consumers. It considers these issues in the context of international and regional planning policies and implications. Finally, the course will focus on the links between private and secondary market networks, the role of governmental and nongovernmental organizations, and the implications for implementation. This seminar will focus on urban design in the planning process, the role of environmental surveys, methods of conducting feasibility studies, and applications of GIS in urban planning. (SP) Bosselmann

242. Urban Design Research Seminar. (1) Three hours of lecture per week. This course is designed for students interested in urban design research and development. Three hours of lecture and four hours of studio per week. (SP) Bosselmann

243. Shaping the Public Realm. (5) Three hours of lecture/designed study. Prerequisites: C240/Landscape Architecture C250; previous design studies. This interdisciplinary studio focuses on the public realm of cities and explores opportunities for creating more humane, safe, and vibrant public places. (SP) Macdonald

244. Advanced Studio: Urban Design/Environmental Planning. (3) Three hours of lecture/designed study. Prerequisites: C240/Landscape Architecture C250; previous design studies. This interdisciplinary studio focuses on the public realm of cities and explores opportunities for creating more humane, safe, and vibrant public places. (SP) Macdonald

245. Urban Design in Planning. (3) Three hours of seminar/discussion per week. Prerequisites: Consent of instructor. Formerly Interdepartmental Studies 249. This seminar will focus on urban design in the planning process, the role of environmental surveys, methods of conducting feasibility studies, and the implications for implementation. (SP) Bosselmann

250. Introduction to Land Use Planning. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course will introduce students to the organization and conduct of local land use planning as practiced in California. The course will cover the following topics: California statutes, the General Plan, specific plans and how to do them, and managing a planning department.

251. Environmental Planning and Regulation. (3) Three hours of lecture per week. Formerly 251. This course will examine emerging trends in environmental planning and policy and the basic regulatory framework associated with environmental planning. Methods of regulation in the United States. We will also relate the institutional and policy framework of California and the United States to other nations and emerging international institutions. (SP) Bosselmann

252. Land Use Controls. (3) Three hours of lecture/discussion per week. This course is designed to provide an advanced course in the implementation of land use and environmental controls. The theory, practice and impacts of zoning, growth management, land banking, development systems, and other techniques of land use control. Objectives are to acquaint students with a range of regulatory techniques and the legal, administrative-political equity aspects of their implementation. (F) Ezell

254. Sustainable Communities. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Formerly 254. Three hours of lecture/required module. This course addresses recurrent planning problems, such as the limits of implementation in varying environmental and political contexts. (SP) Bosselmann

255. Urban Planning Applications of Geographic Information Systems. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. This course introduces students to the relatively new and rapidly expanding field of geographical information systems (GIS). The course focuses on GIS and its application to both city and regional planning and design. Students will perform GIS analyses and explore the concept of sustainable development in urban design, development, and planning. Three hours of lecture and four hours of studio per week. Also listed as Landscape Architecture C250. (F) Southworth

257. The Process of Environmental Planning. (3) Three hours of lecture per week. Formerly 257. Students will receive no credit for C257 after taking Landscape Architecture C237. Three hours of lecture per week. Prerequisites: C251/Landscape Architecture C237. Formerly Planning C257. A review of the techniques used in environmental planning, and evaluation of alternate means of implementation in varying environmental and political contexts. The course will critique a number of well-known environmental planning programs and plans. Lectures and discussions will address recurrent planning problems, such as the limits of implementation, local land use planning. Depending on the particular project...
and client, students will learn how to design, develop, and implement neighborhood specific plans, general plan land use elements, and/or strategic plans.

260. Theory, History, and Practice of Community Development. (3) Three hours of lecture/discussion per week. This course will examine the history, theory, history, methods, and practice of local community development. The course will begin by examining the historical roots of community involvement and the forces that have influenced different paths of neighborhood and community change. (F) Hutson

C261. Citizen Involvement in the City Planning Process. (3) Students will not receive credit for C261 after Fall 2001. Students can take Regional Planning 208, Interdepartmental Studies 206 (fall 1990), and Interdepartmental Studies 206 (fall 1991). Three hours of lecture/seminar per week. Formerly Interdepartmental Studies 223. An examination of the roles of the citizens and citizen organizations in the city planning process. Models for citizen involvement ranging from advising to community control. Examination of the effectiveness of different organizational models in different situations. Also listed as Landscape Architecture C242. Staff

268. Community Development Studio/Workshop. (4) Two hours of lecture and four hours of studio per week. Prerequisites: 208 or 235. Formerly 258. Studio examination of the policy, advising, and implementation in an urban setting. Students will engage in group work for real clients (e.g., community-based organizations or local government agencies), culminating in a final report or proposal. Hutson

270. Regional and Urban Development Strategies in Developing Countries. (3) Three hours of lecture/discussion per week. Competing theories of regional and urban distribution of nonextractive industries and populations. Effects of natural resource distribution on governmental services and infrastructure, and of private investment. Alternative strategies for influencing settlement patterns. Review of experience to date in various nations. (SP) Dowall

271. Development Theories and Practices. (3) Three hours of seminar per week. This course covers the theory and praxis of international development. It studies the project of development, from its Cold War launching to its metamorphosis into the current era of economic globalization and liberalization. It examines the theoretical models and discursive debates that have accompanied each phase, including the recent critiques put forth by feminism and postcolonialism. The course also locates development in the indicative “third world” rather than “third world,” thereby unsettling the normalized hierarchy of First and Third Worlds. (F) Roy

280. Doctoral Seminars. Course may be repeated for credit. Two to three hours of seminar per week. Prerequisites: Ph.D. standing. Doctoral research seminars on research design, methods, and presentation of dissertation work. (F,SP)

280A. Research Design for the Ph.D. (3) Formerly 280C. This course is designed for students working on their dissertation research plan and prospectus. Written research design is a good starting point for each step of writing the prospectus from problem framing to theoretical framework to methodology. At least one oral presentation to the class is required of all students. (F,SP) Staff

280B. Advances Methods for the Ph.D. (3) Advanced research methods focus on doctoral students. Focus on qualitative and/or quantitative methods varies by semester. (F,SP) Staff

280C. Doctoral Colloquium. (2) Must be taken on a satisfactory/unsatisfactory basis. Presentation and discussion of research by Ph.D. students and faculty. (F,SP) Staff

281. Theories of Planning Practice. (3) Three hours of seminar per week. Prerequisites: Graduate standing. Suitable for graduate students in professional programs doing research on planning and planning practice issues. Focuses on theory and practice of planning, with emphasis on the role of different types of knowledge in different kinds of practice. Compares positivist, interpretive, and critical theory views of knowledge and policy analysis, interactive planning, group processes, and emerging models of critical planning practice. (SP) Staff

282. Planning and Governing. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Origins and evolution of the idea of planning, values and ethics in planning behavior, knowledge, power and social action; rationales for governmental intervention in self-regulating social systems. Alternative planning strategies for conditions of uncertainty in the absence of science. (F) Christensen

290. Topics in City and Metropolitan Planning. (1-3) Course may be repeated for credit. Three hours of lecture and discussion per week per module. Prerequisites: Consent of instructor. Analysis of selected topics in city and metropolitan planning with emphasis on implications for planning practice and urban policy formation. In some semesters, optional five-week, 1-unit modules may be offered, taking advantage of guest visitors. Check department for modules at start of semester. (F,SP)

291. Special Projects Studio in Planning. (4-6) Course may be repeated for credit. Two to three hours of lecture and six to nine hours of studio per week, depending on the number of units. Prerequisites: Graduate standing in department and consent of adviser and sponsor. Supervised experience on research projects in planning. Topics vary by semester. (F,SP) Staff

295. Supervised Research in City and Regional Planning. (1-2) Course may be repeated for credit. Regular meeting to be arranged with faculty sponsor. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in department and consent of adviser and sponsor. Supervised experience on research projects in urban or regional planning. Any combination of 295, 297 courses may be taken for a total of 6 units maximum towards the M.C.P. degree. (F,SP)

297. Supervised Field Study in City and Regional Planning. (1-2) Course may be repeated for credit. Regular meeting to be arranged with faculty sponsor. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in department and consent of adviser and sponsor. Supervised experience relative to specific aspects of practice in city or regional planning. Any combination of 295, 297 courses may be taken for a total of 6 units maximum toward the M.C.P. degree. A maximum of 3 units of 297 can be used for degree requirements. (F,SP)

298. Group Studies. (1-3) Course may be repeated for credit. One to three hours of independent study per week. Course may be taken on a satisfactory/unsatisfactory basis. Sections M-Z to be graded on a satisfactory/unsatisfactory basis. Section C to be graded on an In-Progress basis only. Prerequisites: Consent of instructor. Topics to be announced at beginning of each semester. No more than 3 units may be taken in one section.

299. Individual Study or Research. (1-12) Course may be repeated for credit. Regular meeting to be arranged with faculty sponsor. Prerequisites: Consent of instructor. May be arranged for credit. Requirement of satisfactory completion of a study or research program; must be worked out with instructor in advance of signing up for credits. Maximum number of individual study units (295, 297, 299) counted toward the M.C.P. degree credits is 9. (F,SP)

602. Individual Study for Doctoral Students. (1-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Ph.D. students only. Individual study in consultation with the major field adviser, including the opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctorate. One to four units per semester or 1-4 units per summer session. No student may accumulate more than a total of 16 units of 602. (F,SP)

Professional Courses

300. Supervised Teaching in City and Regional Planning. (1-2) Course may be repeated for credit. Regular meeting to be arranged with faculty sponsor. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in department and appointment as a graduate student instructor. Supervised teaching experience in courses related to planning. Course may not be applied toward the M.C.P. degree. (F,SP)

Civil and Environmental Engineering

(College of Engineering)

Department Office: 760 Davis Hall #1710, (510) 642-3261 cs-berkeley.edu

Chair: Lisa Alvarez-Cohen, Ph.D.

Professors

Lisa Alvarez-Cohen (Chair and The Fred and Claire Sawyer Chair of Environmental Engineering), Ph.D. Stanford University. Environmental microbiology, bioremediation, hazardous waste management.

Francisco Armero, Ph.D. Stanford University. Mechanics of solids, computational mechanics.


Robert W. Bea, Ph.D. University of Western Australia, Nedlands. Offshore and coastal structures, ocean and coastal engineering, risk and management.

Jonathan D. Bray, Ph.D. University of California, Berkeley. Earthquake engineering, computational physics, seismology.

Anil K. Chopra (The Taisei Professor of Civil Engineering), Ph.D. University of California, Berkeley. Dynamics of structures, earthquake engineering.

Carl Daganilo (The Roy Horaceff Professor of Civil Environmental Engineering), Ph.D. University of Michigan. Transportation theory, mathematical analysis.

Armen Der Kiureghian (The Taise Professor of Civil Engineering), Ph.D. University of Illinois. Structural risk, reliability analysis.

Filip C. Filipov (The Roy Carlson Distinguished Professor of Civil Engineering, 2004-2007), Ph.D. University of California, Berkeley. Analysis, design of concrete structures.

Ardalan Ghaemi (The Andrew and Rachel Rudulph Family Foundation Professor of Water Safety and Sanitation and Director of Environmental Energy Technologies Division of Lawrence Berkeley National Laboratory), Ph.D. University of California, Berkeley. Technical, economic, and policy research on energy efficiency, especially in developing countries.

Steven D. Gleson, Ph.D. University of Texas. Rock mechanics, acoustics, soil dynamics, system identification, tunnelling.

Allen Goldstein, Ph.D. Harvard University. Atmospheric chemistry, terrestrial biogeochemistry, biophere-climate interactions.

Sanjay Govindjee (Chancellor's Professor), Ph.D. Stanford University. Theoretical solid mechanics.

Mark Hansen, Ph.D. University of California, Berkeley. Air transportation, transportation information systems, transportation economics.

Robert A. Harley (Chancellor's Professor), Ph.D. California Institute of Technology. Air quality, environmental control strategies.

Stewart W. Hermanowicz, Ph.D. University of Toronto. Biological wastewater treatment.


James R. Hunt (The Lawrence E. Pierano Professor of Civil and Environmental Engineering of the Berkeley Water Center), Ph.D. California Institute of Technology. Contaminant transport processes.

C. William Ibs, Ph.D. University of California, Berkeley. Project and construction management, management of technology.

Shaun Li, Ph.D. Northwestern University. Theoretical and applied mechanics, computational mechanics.

Samer Madanat (The XENEL Professor of Engineering and Director of the Institute of Transportation Studies), Ph.D. Massachusetts Institute of Technology. Transportation systems analysis, transportation infrastructure management, statistical methods.

Stephen A. Mahin (The Eric Wilson Chair), Ph.D. University of California, Berkeley. Structural behavior, earthquake engineering.

Overview
The mission of the Department of Civil Engineering at Berkeley is to provide the world's academic leader in civil and environmental engineering, defining the evolving domains of the field through teaching and scholarly research. The department educates undergraduate and graduate students to be knowledgeable, forward-thinking, and ethical professionals, so that they may pursue careers characterized by leadership and innovation. The faculty values interdisciplinary and trans-disciplinary advice and, through research, seeks scientific and technological advances that address critical societal needs. For more information, see the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study at coe.berkeley.edu/college-of-engineering-announcement.

Undergraduate Program
Within the context of this broad objective, the B.S. degree program provides a solid foundation in the scientific and engineering fundamentals along with exposure to humanities and social sciences. This foundation is essential for solving societal problems in the areas of public safety, resource protection, and environmental engineering. It is also the efficient functioning of urban and natural systems within the United States and worldwide.

The four-year undergraduate curriculum leading to the B.S. degree provides an education that is sufficient to compete for positions for students who wish to embark on a professional career directly after graduation and keep abreast of new developments in civil engineering practice. The program also serves as a preparation for graduate study in any of the specialized branches of civil and environmental engineering. The B.S. program in civil engineering is accredited by the Engineering Accreditation Commission of the ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700.

Curriculum and Requirements for the Bachelor's Degree
The undergraduate curriculum provides a broad general education in civil engineering. In addition, students with a specific interest within civil and environmental engineering may select an optional area of emphasis in Engineering and Project Management; Environmental Engineering; Geotechnical Engineering; and the civil engineering program. Full details of these curricula can be found in the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study available online at coe.berkeley.edu/college-of-engineering-announcement. Also see our optional areas of emphasis in the Announcement for suggested programs of study.

Minors
The department offers three minors in structural engineering, geoenvironmental engineering, and environmental engineering. The structural engineering minor is designed particularly for students in the Department of Architecture but is also available for students who are enrolled in a non-civil and environmental engineering minor. For details, contact the Civil and Environmental Engineering Academic Affairs Office, 750 Davis Hall, (510) 643-6640.

Graduate Program
The Department of Civil and Environmental Engineering offers a graduate program comprised of broad, foundational graduate programs: Engineering and Project Management; Environmental Engineering; Geoenvironmental Engineering; Structural Engineering, Mechanics and Materials; Transportation Systems; and Transport and Transit. The Civil Systems Program and the Energy, Civil Infrastructure, and Climate programs are cross-disciplinary and span the other programs. Students may pursue academic degrees of Ph.D., and the professional degree of M.Eng. The M.S. program normally lasts one year and the M.Eng. program, two years; the doctoral program requires at least two years after the attainment of a master's degree and includes a dissertation or an equivalent design project. The department also offers programs leading to dual degrees in the following areas: (1) M.S. in Engineering and Master of Architecture (SEVM and the Department of Architecture (SEMM and the Department of Architecture (SEMM and the Department of Architecture), (2) M.S. in Engineering and Master of City Planning (Transportation and the Department of City and Regional Planning), and (3) M.S. in engineering and Master of Public Policy (Environmental Engineering and the School of Public Policy).

The Department of Civil and Environmental Engineering includes the following areas of professional specialization:

Civil Systems. Civil systems integrates engineering, science, and management tools and techniques for solving complex civil engineering problems. To understand the interdisciplinary nature and many scales of civil and environmental engineering problems, students must develop a broad understanding and knowledge in engineering, science, and management tools and techniques for solving complex civil and environmental engineering problems. The structural engineer, human organizational factors, quality and management, and environmental fluid mechanics.

Energy, Civil Infrastructure, and Climate. This graduate program focuses on the application of engineering, environmental, economic, and policy principles to the analysis and design, development, and improvement of civil infrastructure from the perspective of energy and climate impacts. Example focus areas include energy efficiency of buildings, environmentally-informed design of transportation systems, embodied energy of construction materials, biofuels, and adaptation of infrastructure to a changing climate.

Engineering and Project Management. Engineering and project management deals with planning, organizing, leading, constructing, designing, operating, and financing projects during the life cycle of civil engineered systems. This program is concerned with the fundamental principles and knowledge that underlie leadership, human organizational factors, quality and reliability assessments, life cycle engineering and management processes, engineering and the environment, cost control, project management, and implementation processes and strategies.

Environmental Engineering. Environmental engineering involves the application of science and technology to manage environmental resources and prevent or limit environmental degradation. Specific subject areas include water and air quality engineering, hazardous waste management, ecological engineering, hydrology and water resources management, and environmental fluid mechanics.
Goengineering. Goengineering is concerned with planning, design, and construction on, in, or with soil and rock, and with protection and enhancement of the environment. It includes the fields of soil mechanics, foundation engineering, geological engineering, rock mechanics, environmental geotechnics, groundwater, and geotechnical aspects of earthquake engineering. Also included is the field of geotechnical geosciences which adds geophysics, reservoir modeling, and petroleum engineering.

Structural Engineering, Mechanics, and Materials. Structural engineering, mechanics, and materials are core emphases. Structural engineering is concerned with the analysis and design of all types of structures, including earthquake-resistant design. Structural mechanics emphasizes the development of applied mathematics and the engineering sciences to examine a wide range of problems in the behavior of structural elements and systems, and to investigate the mathematical description of properties. Structural materials engineering is concerned with the development of construction materials for engineering projects, such as mechanical and thermal response, microstructure behavior and durability. Structural materials include steel, concrete, aluminum alloys, timber, plastic, and composite materials.

Transportation Engineering. Transportation engineering is concerned with the planning, design, construction, operation, performance, evaluation, maintenance, and rehabilitation of transportation systems and facilities, such as highways, railroads, urban transit, air transportation, logistic supply systems, and pipelines.

For more details, see the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study or contact the department's Academic Affairs office in 750 Davis Hall, (510) 643-6640.

In addition to the courses listed below, the Department of Civil and Environmental Engineering offers the following courses found in the Engineering section of this catalog: ENG 7, Introduction to Computer Programming for Scientists and Engineers, and ENG 10, Engineering Design and Analysis.

Lower Division Courses

11. Engineered Systems and Sustainability. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: Chemistry 1A, Mathematics 1A. Formerly Engineering 11. An introduction to key engineered systems (e.g., energy, water supply, building, transportation, etc.) and their environmental impact. Basic principles of environmental science needed to understand natural processes as they are influenced by human activities. Overview of concepts and methods of sustainability analysis. Critical evaluation of engineering approaches to address sustainability. (F,SP) Harley, Horvath, Hunt, Nelson

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week, 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Staff

C30. Introduction to Solid Mechanics. (3) Three hours of lecture and three hours of discussion per week. Prerequisites: Mathematics 53 and 54 (may be taken concurrently): Physics 7A. A review of equilibrium for particles and rigid bodies. Application to truss structures and the concepts of deformation, strain, and stress. Equilibrium equations for a continuum. Elements of the theory of linear elasticity. The states of plane stress and plane strain. Solution of elementary elasticity problems (beam bending, torsion of circular bars), Euler buckling in elastic beams. Also listed as Mechanical Engineering C85. (F,SP) Armero, Papadopoulos, Zohdi

60. Structure and Properties of Civil Engineering Materials. (3) Students may receive 2 units of credit for 60 after taking Engineering 45. One unit of deficient grade may be removed in Engineering 45 with 60. Two hours of lecture and three hours of laboratory per week. Introduction to structure and properties of civil engineering materials such as asphalt, cements, concrete, geological materials (e.g. soil and rocks), steel, polymers, and wood. The properties range from elastic, plastic and fracture properties to toughness, creep, stress corrosion, and fatigue. Emphasis is on testing methodology. Laboratory tests include evaluation of behavior of these materials under a wide range of conditions. (F,SP) Monteiro, Ostertag

70. Engineering Geology. (3) Three hours of lecture and two hours of laboratory per week. One field trip required. Prerequisites: Chemistry 1A (may be taken concurrently). Principles of physical and structural geology; the influence of geological factors on engineering works and the environment. Field trip. (F,SP) Glaser, Stier

92. Introduction to Civil and Environmental Engineering. (1) One hour of lecture per week. Must be taken on a passed/not passed basis. A course designed to familiarize the entering student with the nature and scope of environmental engineering and its component specialty areas. (F,SP) Staff

93. Engineering Data Analysis. (3) Students will receive no credit after taking Statistics 25. Two hours of lecture and three hours of laboratory per week. Prerequisites: Engineering 7. Application of the concepts and methods of probability theory and statistical inference to CEE problems and data; graphical data analysis and sampling; elements of set theory; elements of probability theory; random variables; and expectations and variance. Application to various CEE problems and real data will be developed by use of MATLAB and existing codes. The course also introduces the student to various domains of uncertainty analysis in CEE. (F,SP) Der Kagurehian, Hansen, Madanat, Rubin

98. Supervised Group Study and Research. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised group study and research by lower division students. (F,SP)

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and minimum GPA of 3.0. Supervised independent study by lower division students. (F,SP) Upper Division Courses

100. Elementary Fluid Mechanics. (4) Three hours of lecture and one hour of recitation per week, plus individual laboratory experiments. Prerequisites: C30/ Mathematics 83 and 93, 94 (may be taken concurrently). Fluid statics and dynamics, including laboratory experiments with technical reports. Fundamentals: integral and differential formulations of the conservation equations solved in special cases such as boundary layers and pipe flow. Flow visualization and computation techniques are introduced using MATLAB. Empirical equations are used for turbulent flows. Theories and principles of empirical equations are also discussed: dimensional analysis, regression, and uncertainty. (F,SP) Chow, Stacey, Variano

101. Fluid Mechanics of Rivers, Streams, and Wetlands. (3) Three hours of lecture per week. Prerequisites: 100 and permission of instructor. Analysis of steady and unsteady open-channel flow and application to rivers and streams. Examination of mixing and transport in rivers and estuaries. Review of fluid flow in pipes, force and moment, and control volumes. Use of chezy and cramer formulas. Sediment transport in rivers, streams, and wetlands. Implications for freshwater ecosystem function. Offered alternate years. (SP) Variano

103. Introduction to Hydrology. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: 93 and 100. Course addresses principles and practical aspects of hydrology. Topics in introduction to hydrology include hydrological cycle, water balance, precipitation, snowfall, snow and snowmelt, and streamflow; introduction to geo-morphology, GIS (geographic information systems) applications, theory of unit hydrograph, frequency analysis, flood routing, rainfall-runoff analyses, watershed modeling, urban hydrology, and introduction to ground-water hydrology. (F,SP) Staff

105. Applied Environmental Fluid Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 100. Hands-on course in applied fluid mechanics for advanced undergraduate or graduate students. Course goes beyond basic examples of fluid flow to include detailed discussion of real-world environmental applications. Class term projects used to explore real fluid mechanics, e.g., atmospheric and surface water flows in a local area. Integrated research and education emphasized through outreach efforts to the general public. Specific project topics vary. (SP) Chow, Stacey, Variano

C106. Air Pollution. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B and Physics 8A or equivalent or consent of instructor. This course covers atmospheric chemistry and the chemistry of the Earth’s atmosphere. We will focus on the fundamental natural processes controlling trace gas and aerosol concentrations in the atmosphere, and how anthropogenic activity has affected these processes at the local, regional, and global scales. Specific topics include stratospheric ozone depletion, increasing concentrations of greenhouse gases, smog, and changes in the oxidation capacity of the troposphere. All except Planetary Science C180 and Environ Sci, Policy, and Management C180. (F) goldstein

107. Climate Change Mitigation. (3) Three hours of lecture per week. Prerequisites: Upper division or graduate standing in environmental science, or consent of instructor. Assessment of technological options for responding to the threat of climate change. Overview of climate-change science: sources, sinks, and atmospheric dynamics and greenhouse gases. Current systems for energy supply and use. Renewable energy resources, transport, storage, and transformation technologies. Technological opportunities for improving end-use energy efficiency. Recovery, reuse, and recycling of materials and waste. Combustion of fossil-fuel combustion. Societal context for implementing engineered responses. (SP) Nazaroff

108. Air Pollutant Emissions and Control. (3) Three hours of lecture per week. Prerequisites: 111 or consent of instructor. Analysis of air pollution sources and methods for controlling emissions, with a focus on transportation-related air pollution. Combustion system fundamentals and pollutant formation mechanisms. Control of emissions from spark-ignition and compression-ignition engines. (SP) Harley

111. Environmental Engineering. (3) Three hours of lecture per week. Prerequisites: 100 required, 111 recommended, or consent of instructor. Quantitative overview of the properties of environmental contaminants and the processes that govern their concentrations in air and water. Fundamental topics include environmental chemical equilibria and kinetics, reactor models, and elementary environmental reaction mechanisms. Emphasis on issues in water quality engineering, air quality engineering, and hazardous waste management. (F,SP) a Alvarez-Cohen, Nazaroff

112. Environmental Engineering Design. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 100, 111 required; 167 recommended. Engineering design and project manage-
ment of environmental quality control systems. Students will complete a design project focusing on pollution control in one of the following systems: wastewater treatment plant, sanitary landfill, municipal waste incinerator, contaminated groundwater remediation, or fossil-fuel-fired power plant. Lectures will address process design, economic optimization, legal and institutional aspects of design, and project management. (SP) Hermanowicz

113N. Ecological Engineering for Water Quality Improvement. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 111 or consent of instructor. Ecological engineering approaches to modeling contaminated water using natural rea-
procedures to improve water quality. Emphasis on combining basic science and engineering approaches to understand the fundamental processes that govern the effectiveness of natural treatment systems. Applications include constructed wetlands, wastewater stabilization ponds, stormwater bioretention, decentralized wastewater management, ecological sanitation. Laboratory sessions will consist of design and monitoring of laboratory and full-scale natural treatment systems, including a range of water quality measurements. (F) Nelson

114. Environmental Microbiology. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A-1B. The scope of modern environmental microbiology requires a fundamental knowledge of microbial processes with specific application to water, wastewater and the environmental fate of pollutants. This course will cover microbial physiology, bioenergetics, metabolism, growth energetics and kinetics, ecology, pathogenicity, and genetics for application to both engineered and natural environmental systems. (F) Alvarez-Cohen

115. Water Chemistry. (3) Three hours of lecture per week. Prerequisites: Upper division or graduate standing in engineering or physical science, or consent of instructor. The application of principles of inorganic, physical, and dilute solution equilibrium chemistry to aquatic systems and to aquatic environmental systems and in water and wastewater treatment processes. (F) Sedlak

C116. Environmental Aqueous Geochemistry. (3) Three hours of lecture per week. Prerequisites: 111 or equivalent. Chemical mechanisms of reactions controlling the fate of pollutants in the subsurface environ-
ment. Chemical reactions in subsurface waters. Geochemical pathways of detoxification. Chemical modeling of pollutant geochemistry. Also listed as Envi-
ron Sci, Policy, and Management C128. (SP) Sposito

120. Structural Engineering. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: C30/Mechanical Engineering C85 or 130; 60. Introduction to design and analysis of structural systems. Loads and deflections of structures. Statics and dynamics of members in steel, reinforced concrete, and timber. Structural analysis theory. Hand and computer analy-
sis methods, validation of results from computer analysis. Applications, including bridges, buildings, frames, and long-span cable structures. (F,SP) Moehle, Stojadinovic


122. Design of Steel Structures. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 120. Behavior and design of structural members and connections using load and Resis-
tance Factor (LRFD) method; tensile members, compression members, beams and beam-columns; typical shear and moment connections, welded and bolted. Behavior and characteristics of steel structures. A term project is assigned to design the construction of a steel building structure, including resistance to earthquake loads. Laboratory includes problem-solving sessions and actual testing of steel components. (F,SP) Astanesh, Stojadinovic

123. Design of Reinforced Concrete Structures. (3) Two hours of lecture and three hours of labora-
tory per week. Prerequisites: 120. Introduction to mate-
rials and methods of reinforced concrete construction; behavior and design of reinforced concrete beams and one-way slabs considering deflections, flexure, shear, and stability. Methods of analysis including slenderness effects; design of spread foot-
ings; design of lateral load resisting frames and walls for earthquake effects. Laboratory includes exper-
imental and design sessions leading to design of a structural design project in reinforced concrete. (F,SP) Mahin, Mosalam

124. Structural Design in Timber. (3) Three hours of lecture per week. Prerequisites: 120. Character-
istics and properties of wood as a structural material; design and detailing of structural elements and entire structures of wood. Topics include allowable stresses, design and detailing of solid sawn and glulam beams and columns, nailed and bolted connections, plywood diaphragms and shear walls. Case studies. (F,SP) Mahin, Filipou

130N. Mechanics of Structures. (3) Students will receive no credit for 130N after taking 130. Two hours of lecture and three hours of computer laboratory per week. Prerequisites: Linear Engineering 21B, C85, and either 60 or Engineering 45. Elastic and plastic stress and deformation analysis of bars, shafts, beams, and columns; energy and variational meth-
ods; plastic analysis of structures; stability analysis of structural systems; structural optimization techniques for the solution of engineering problems and modular computer programming methods. (F,SP) Filipou, Govindjee, Li

131. Advanced Mechanics of Materials. (3) Three hours of lecture per week. Prerequisites: 120 or 130N; senior or graduate standing. Mechanics of load-carrying members: stress, strain, elastic stress-strain relations, work and energy, boundary-value problems. Torsion. Beams. Buckling. midfielder bending, thermoelastic bending, thin-walled and sand-
wich beams, introduction to plate theory. Buckling of bars. (F) Armero, Li

C133. Engineering Analysis Using the Finite Element Method. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: Engineering 7 or Computer Science 61A; Mathematics 53 and 54; senior status in engineering or applied sci-
ence. This is an introductory course on the finite ele-
ment methods; governing equations and boundary condi-
tions; and applied science disciplines. The course covers the basic topics of finite element technology, including domain discretization, polynomial interpolation, appli-
cation of the method to a wide variety of problems, and solution of the resulting algebraic sys-
tems. Finite element formulations for several important field equations are introduced using both direct and integral approaches. Particular emphasis is placed on computer simulation and analysis of realistic engi-
neering problems from solid and fluid mechanics, heat transfer, and electromagnetism. The course uses FEMLAB, a multiphysics MATLAB-based finite ele-
ment program that possesses a wide array of mod-
eling capabilities and is ideally suited for instruction. Assignments will involve both paper- and computer-
based exercises. Computer-based assignments will em-
phasize the practical aspects of finite element model construction and analysis. Also listed as Mechanical Engineering C180. (SP) Staff

140. Failure Mechanisms in Civil Engineering Mate-
rials. (3) Three hours of lecture per week. Prerequi-
sites: 60. Failure analysis of engineering materials (cement-based materials, metallic- and poly-
mer-based materials) are associated with process-
ing, microstructure, stress states, and environmental changes. Fracture mechanics and 3-D structures; bonding and ductile materials; cracking processes in mono-
lithic, particulate, and fiber reinforced materials; exam-
plest of ductile/brittle failure transitions in civil engineering structures; retrofitting of existing struc-
tures; non-destructive techniques for damage detec-
tion. (SP) Ostertag

153. Transportation Facility Design. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 155. Geometric design of transporta-
tion facilities based on operational constraints, and safety considerations. Pavement design and rehabilitation. Emphasis on airports, including land and air-side features. (SP) Kanafani, Madanat, Skajaa

C154. Introduction to Urban and Regional Trans-
portation Planning. (3) Three hours of lecture/dis-
cussion per week. This course is designed to introduce students to the characteristics of urban transportation systems, the methods through which they are planned and analyzed, and the dimensions of key policy issues confronting decision makers. (SP) Staff

155. Transportation Systems Engineering. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Sophomore standing in engi-
neering or consent of instructor. Operation, manage-
ment, control, design, and evaluation of passenger and freight transportation systems. Their economic role. Demand analysis. Overall logistical structure. Models and modeling techniques: time-space diagrams, queuing theory, network analysis, and simulation. Design of control strategies for simple systems. Feedback effects. Paradigms. Transportation modeling; noise; air pollution. Multi-criteria evaluation and decision making. Financing and policies. (SP) Staff

156. Infrastructure Planning and Management. (3) Three hours of lecture per week. Prerequisites: Math-
ematics 1A-1B and Civil Engineering 93 (or equiva-
rence). Course focuses on infrastructure systems that support society, including transportation, communications, power, water, and waste. These are complex, large-scale systems that must be planned and managed over a long-term horizon. En-
conomics-based, analytical tools are covered, including topics of supply, demand, and evaluation. Problem sets, case studies, and a class project provide for hands-on experience in analyzing and managing infra-
systems, issues, and methods of analysis. (F) Walker

165. Concrete Materials and Construction. (3) Three hours of lecture per week. Prerequisites: 60. Consideration of the broad aspects of use of concrete in construction; technical requirements; selection of materials; control of quality; types of concrete and construction methods used for buildings, highways, airfields, bridges, dams and other hydraulic structures. Laboratory demonstration on concrete testing and eval-
uation methods, field trip to construction sites. (SP) Group and individual projects on concrete construction. (SP) Monteiro

166. Construction Engineering. (3) Two hours of lecture and three hours of laboratory or field trip per week. Prerequisites: Upper division standing, 167 rec-
ommended. Introduction to construction engineering and field operations. The construction industry, con-
struction methods and practice, productivity improve-
ment, equipment selection, site layout formwork, erection of steel and concrete structures. Labs demon-
strate the concepts covered. Field trips to local con-
struction projects. (F) Horvath

167. Engineering Project Management. (3) Students will receive 2 units of credit for 167 after taking Engineering 120. Three hours of lecture per week. Prerequisites: 93 (can be taken concurrently) or equiv-
alent. Principles of economics, decision making, and law applied to company and project management. Business ownership, liability and insurance, project planning and scheduling, cost control. (F,SP) Ibs, Tommelein

169A. Web-Based Systems for Engineering and Management. (1) Three hours of lecture for five weeks. Prerequisites: Junior, senior, or graduate stand-
ning; 169A recommended before taking 169B or 169C. A series of course modules on computer methods and tools for engineering and management, empha-
sizing the systems approach. Each 1-unit module will
run for a segment of the semester, and will cover theory and hands-on laboratory exercises. Students may take 1-3 modules per semester. The course is a combination of lectures, readings, hands-on exercises, homework assignments, and a project. The project is an opportunity for students to design and implement a database application suitable to their own interests. (SP) Horvath, Tommelein

169B. Database Systems for Engineering and Management. (1) One and one-half hours of lecture per week. Prerequisites: Junior, senior, or graduate standing; 169A recommended before taking 169B or 169C. A series of course modules on computer methods and tools for engineering and management applications. Each 1-unit module will run for a segment of the semester, and will cover theory and hands-on laboratory exercises. Students may take 1-3 modules per semester. Theory, design, and applications of databases and database management systems in engineering and management research and practice. Programming in SQL. Programming using standard productivity software. The course is a combination of lectures, readings, hands-on exercises, homework assignments, and a project. The project is an opportunity for students to develop a web-based application suitable to their own interests. (SP) Horvath, Tommelein

170. Introduction to Geological Engineering. (3) Three hours of lecture per week. Prerequisites: 70 or an introductory course in physics; assignees’ permission; or consent of instructor. A division standing in engineering. Geological and geophysical exploration for structures in rock; properties and behavior of rock masses; rock slope stability; geologic interpretation of underground openings; evaluation of rock foundations, including dams. No final examination. (SP) Glaser

171. Introduction to Rock Mechanics. (3) Students will receive no credit for C172 or Material Science C172 taken prior to fall 2001. Three hours of lecture/demonstrations per week. Prerequisites: Upper division standing in engineering or science. Formerly C172 and Material Science C172. Introduction to analysis of stress and strain and its application to fracture and deformation in rocks of all kinds. Applications in mining and civil engineering involving design of underground openings in competent, layered, and plastic rocks, slopes cut in jointed rock, and foundations on weak rocks. (F) Glaser

173. Groundwater and Seepage. (3) Three hours of lecture and one hour of discussion/laboratory per week. Prerequisites: Senior standing in engineering or science; 100 recommended. Introduction to principles of groundwater flow, including steady and transient flow in homogeneous porous media, numerical analysis, pumping tests, groundwater geology, contaminant transport, and design of waste containment systems. (F,SP) Rubin, Stitar

175. Geotechnical and Geoenvironmental Engi- neering. (3) Three hours of lecture and three hours of discussion/laboratory demonstration period per week. Prerequisites: 130 or 130N (may be taken concurrently). 70 and 100 recommended. Soil formation and identification. Engineering properties of soils. Funda- mental aspects of soils, including soil mineralogy, soil-water movement, effective stress, consolidation, and soil strength. Geosynthetics and material interface properties. The use of soils and geosynthetics in geotechnical and geoenvironmental applications. Site investigation techniques. Laboratory testing and evaluation of soil composition and properties. (F,SP) Bray, Pestana, Seed, Sitar

176. Environmental Geotechnics. (3) Three hours of lecture per week. Prerequisites: 175 required (or consent of instructor); 111 and 173 recommended. Principles of environmental geotechnics applied to waste encapsulation and remediation of contaminated sites. Engineering aspects of construction of landfills, properties of soils and geosynthetics and their use in typical applications. Fate and transport of contaminants. Fundamental principles and practices in groundwater remediation and remediation of environmental and geotechnical in the design and construction of waste containment systems. Discussion of soil remediation and emerging technologies. (SP) Pestana, Sitar

177. Foundation Engineering Design. (3) Three hours of lecture per week. Prerequisites: 120 and 175 or consent of instructor. Principles of foundation engi- neering. Shear strength of soil. Theories related to design of retaining structures, shallow founda- tions, deep foundations, and slope stability. The course has a design emphasis each of the major topics in an integrated fashion. (F) Bray, Seed


179. Pavement Engineering. (3) Three hours of lecture per week. Prerequisites: C30/Mechanical Engineering C69N. A first course in pavement engineering for highways and airfields, including failure mechanisms, design approaches, new pavement and rehabilitation design, effects of materials on pavement performance. Emphasis on understanding of fundamental issues of pavement engineering, approaches to evaluation and design for new pavements and maintenance and reha- bilitation design, practical experience with asphalt concrete materials and tools used for evaluation and design of pavements, understanding of construction issues, and effects on pavement performance. Offered alternate years. (F) Staff

180. Design, Construction, Maintenance of Civil and Environmental Engineered Systems. (4) Three hours of lecture and one hour of discussion per week. This course includes segments on engineer- ing leadership and management, teamwork and development of critical thinking, and analysis and design of engi- neered systems, the engineering Standard of Care, evaluation of constraints and trade-offs in engineering, life-cycle engineering (design through decommis- sioning), development of factors of safety, and strate- gies for management of human and organizational factors. Students form teams to address real-life proj- ects selected by the teams that involve application of the course developments, their backgrounds, and experiences. (F) Bayen, Madanat, Sengupta

191. Civil and Environmental Engineering Sys- tems Analysis. (3) Two hours of lecture and three hours of computer laboratory per week. Prerequisites: 93, Engineering 7 or 77, Formerly 152. This course is organized around the prerequisite CEE systems problems. The problems provide the moti- vation for the study of quantitative tools that are used for planning or managing these systems. The prob- lems include design of a public transportation system for an urban area, resource allocation for the main- tenance of a water supply system, development of repair and replacement policies for reinforced con- crete structures, traffic signal control for an ar- tillery street, scheduling in a large-scale construction project. (F) Bayen, Madanat, Sengupta

192. The Art and Science of Civil and Environ- mental Engineering Practice. (1) One hour of lecture per week. Prerequisites: Senior standing in civil and environmental engineering; previously C30 or C102. This course is based on lectures by distinguished professionals designed to provide an appreciation of the role of science, technology, and the needs of society in conceiving projects, balanc- ing the interplay of conflicting demands, and utilizing a variety of disciplines to produce unified and efficient systems. (SP) Staff


H194. Honors Undergraduate Research. (3-4) Course may be repeated for credit only. Three to four upper-division independent honors research projects each week. Prerequi- sites: Upper division technical GPA 3.3, consent of instructor and faculty adviser. Supervised research. Students who have completed three or more upper-division research courses may pursue original research under the direction of one of the members of the staff. A final report or presentation is required. A maximum of 4 units of H194 may be used to fulfill the technical elective requirement. (F,SP) Staff

197. Field Studies in Civil Engineering. (1-4) Course may be repeated for credit. One to four hours of field- work per week. Must be taken on a passed/not passed basis. Supervised experience in off-campus compa- nies relevant to specific aspects and applications of civil engineering. Written report required at the end of the semester. (F,SP) Staff

198. Directed Group Study for Advanced Under- graduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequi- sites: Senior standing in engineering. Group study of a selected topic or topics in civil engineering. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of 4 units per semester. Introduction to Courses and Curricula section of this catalog. Indi- vidual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. (F,SP) Staff

Graduate Courses

200A. Environmental Fluid Mechanics. (3) Students will receive no credit for 200A after taking 105 before fall 1999. Three hours of lecture per week. Prerequi- sites: 100; Mathematics 53, 54, or equivalents. Fore- seen application of fluid mechanics to water and air environment. Flux equation analyses; unsteady free surface flow; stratified flow; Navier-Stokes equa- tions; boundary layers, jets and plumes; turbulence, Reynolds equations, turbulence modeling; mixing, diffu- sion, dispersion, and contaminant transport; geo- physical flows in atmosphere and ocean; steady and unsteady flow in porous media. Application to envi- ronmental fluid mechanics sensitive to groundwater- and in lower atmosphere. (F) Chow, Stacey

200B. Numerical Methods for Environmental Flow Modeling. (3) Three hours of lecture per week. Prerequi- sites: 200A or consent of instructor. Formerly 204. Introduction to numerical methods with application to environmental flows (groundwater, surface water, and subsurface flows). Scalar advection/diffusion
equations used to study finite difference schemes, numerical errors and stability. Methods introduced for solving Navier-Stokes equations and for turbulence modeling with emphasis on large-eddy simulating. Basic programming skills required for hands-on exercises. (SP) Chow

200C. Transport and Mixing in the Environment. (3) Three hours of lecture per week. Prerequisites: 100, Math 53 and 54, or equivalent. Formerly 209A. Application of stochastic transport and mixing concepts in the environment. Fundamentals of turbulence, turbulent diffusion, and shear dispersion in steady and oscillatory flows and the effects of stratification. Application to river transport, estuaries, coastal ocean, and the lower atmosphere. (F) Stacey

202A. Vadose Zone Hydrology. (3) Students will receive no credit if 290G completed before fall 1999. Three hours of lecture per week. Prerequisites: 173 or equivalent. Formerly 202. Course addresses fundamental and practical issues in flow and transport phenomena in the vadose zone, which is the geologic media between the land surface and the regional water table. A theoretical framework for modeling these phenomena will be presented, followed by applications in the areas of ecology, drainage and irrigation, and contaminant transport. Hands-on applications using numerical modeling and analysis of real-life problems, and field experiments will be emphasized. (F) Rubin

202B. Geostatistics and Stochastic Hydrogeology. (3) Students will receive no credit if 290G completed before fall 1999. Three hours of lecture per week. Prerequisites: 173 and Mathematics 53, 54, or equivalent, or consent of instructor. Formerly 202B. Topics in analysis and modeling of spatial heterogeneity, estimation in the earth sciences, and flow and transport processes in geological environments. Course emphasizes modern tools for modeling transport under conditions of spatial heterogeneity of the hydrogeologic parameters. Fundamentals of the stochastic approach to spatial variability analysis, known as geostatistics, and fundamental as well as practical aspects of flow and transport in heterogeneous formations. (SP) Rubin

203N. Surface Water Hydrology. (3) Three hours of lecture per week. Prerequisites: 103 or equivalent, or consent of instructor. Formerly 203N. Course addresses topics of surface water hydrology, such as processes of water in the atmosphere, over land surface, and within soil; advanced representation and models for infiltration and evapotranspiration processes; partition of water fluxes at the land surface; snow and snowmelt processes; applications of remote sensing; flood and drought; and issues related to advanced hydrological modeling. Students will address practical problems in the field on how to use the current operational hydrologic forecasting model and build hydrological models. (F) Staff

205B. Margins of Quality for Engineered Systems. (3) Three hours of lecture per week. Prerequisites: 125, 193, or equivalents and senior design experience. Processes and procedures to define and determine the demands and capacities of the structures and hardware elements of engineered systems during their life-cycles: margins of quality. The objective of this course is to provide students with the knowledge and skills to define and evaluate system demands, capacities, and reliability targets to be used in design, requalification, construction, operation, maintenance, and decommissioning of engineered systems. (F) Bea

210A. Control of Water-Related Pathogens. (3) Three hours of lecture per week. Prerequisites: Background in microbiology recommended; graduate standing or consent of instructor. Comprehensive strategies for the assessment and control of water-related human pathogenic and emerging microorganisms. Transmission routes and life cycles of common and emerging organisms, conventional and new detection methods (based on molecular techniques), human and animal health, transport of waterborne pathogens, and control of waterborne pathogens. (SP) Nelson

211A. Environmental Physical-Chemical Processes. (3) Three hours of lecture per week. Prerequisites: 111 or equivalent and coursework in aquatic systems. An introduction to the characteristics of physical-chemical processes that affect water quality and engineered environmental systems. Focus is on developing a qualitative understanding of the fundamental and practical tools to describe, predict, and control the behavior of physical-chemical processes. Topics include reactor hydraulics and reaction kinetics, gas transfer, adsorption, particle characteristics, filtration, membranes, and disinfection. (F) Nelson

211B. Environmental Biological Processes. (3) Three hours of lecture per week. Prerequisites: 111 or equivalent and coursework in microbiology, or consent of instructor. Fundamental concepts of biological processes that are important in engineered environmental systems, especially those affecting water quality. Incorporates basic fundamentals of microbiology into a quantitative engineering context to describe, predict, and control behavior of environmental biological systems. Topics include the stoichiometry, energetics and kinetics of microbial reactions, suspended and biofilm processes, carbon and nutrient cycling, and bioremediation applications. (SP) Alvarez-Cohen

212. Water Quality Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Principles and engineering applications of technical processes for water and wastewater treatment, and water reclamation: separation and transformation technologies; biogeochemical processes, oxidation, biodegradation, activated sludge, bioreactors, biological treatment of drinking water, solids processing, disinfection). Application of fundamen-tal principles for design and with a focus on commonalities in applications across industries. Regulatory process and drivers. (SP) Hermanowicz

213. Watersheds and Water Quality. (3) Students will receive no credit for 213 after taking 290C. Three hours of lecture per week. Prerequisites: Graduate standing or equivalent, or consent of instructor. Overview of approaches used by engineers to preserve or improve water quality at the watershed scale. Characteriza-tion and modeling of nutrients, metals, and organic compounds in watersheds. Application of ecosystems principles and pollutant trading to enhance water quality. The course emphasizes recent case studies and interdisciplinary approaches for solving water quality problems. (SP) Sedlak

214. Environmental Analytical Chemistry. (3) One hour of lecture and six hours of laboratory per week. Prerequisites: 115 or equivalent. This course addresses the principles and practices used to quanti-tify trace elements in water, sediments, soils, and in the environment. Students will use modern analytical techniques to quantify pollut-ants in air, sediments, soils, and water at sites of local interest. In addition, they will assess pollutant fate, transport and degradation as well as techniques for remediating environmental contamination. During the final third of the course, students will implement independent projects to characterize pollutants at a site of their choice. (SP) Sedlak

215. Process Engineering Laboratory. (3) One hour of lecture and six hours of laboratory per week. Prerequisites: 115L, 117L (may be taken concurrently), 211, 212 (may be taken concurrently). Unit operations and processes for water and wastewater treat-ment. Lectures and laboratories on tracers, filtration, aeration, ion exchange, chemical treatment of waste-water, biological filters, activated sludge, and anaerobic digestion. (SP) Hermanowicz

217. Environmental Chemical Kinetics. (3) Three hours of lecture and laboratory. Prerequisites: Graduate standing or consent of instructor; 115 or 214 or equivalent. Kinetic aspects of chemical fate and transport in aquatic systems. Quantitative descriptions of the kinetics of intermedia transport and pollutant transformation by abiotic, photochemical, and biological reactions. Techniques for the estimation of environmental reaction rates. Development of models of pollutant behav-iors in complex natural systems. (SP) Sedlak

218. Air Quality Engineering. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or consent of instructor. Quantitative assessment of the characteristics of air pollution problems. Summary of fundamental chemical and physical processes governing pollutant behavior. Analysis of key elements of the air pollution system: source and control strategies, control of pollution from stationary and non-stationary emissions. (F) Nazaroff, Harley

218B. Air Pollutant Dynamics. (3) Three hours of lecture per week. Prerequisites: 218A. Study of the behavior of gaseous and particulate air pollutants, in relation to understanding fate of pollutants, control device performance, and measurement sys-tems. Particle and gas deposition. Light scattering and visibility impairment. Particle-gas interactions. Issues in monitoring and experimentation. (SP) Nazaroff


221. Nonlinear Structural Analysis. (3) Three hours of lecture per week. Prerequisites: 220. Theory, modeling, and computation for analysis of structures with material and geometric nonlinearities. Sources of non-linearity: formulation strategies for static and dynamic loads. Modeling of inelastic materials and members. P-delta and large deformation theory. Analysis of sta-bility. Practical applications. (SP) Filippou


223. Earthquake Protective Systems. (3) Students will receive no credit for 223 after taking 290D. Three hours of lecture per week. Prerequisites: 220, 225, or consent of instructor. Formerly 290D, Concepts and analysis of structural systems including seismic isolation and energy absorbing techniques. Design rules for seismic isolation, energy absorbing and self-centering systems. Characteristics of isolation bearings, frictional, metallic and energy absorbing devices, code provision for earthquake protective sys-tems. Applications to new and existing structures. (F SP) Mahin, Panagiotou

225. Dynamics of Structures. (3) Three hours of lecture per week. Prerequisites: 220 (may be taken concurrently) or equivalent. Evaluation of deforma-tions and forces in structures, idealized as single-degrees-of-freedom systems. Introduction to dynamic response of freedom systems, due to dynamic forces. Evaluation of earthquake-induced deformations and forces in structures by linear response history analysis; esti-mation of maximum response by response spectrum analysis; effects of interval behavior. Laboratory demonstrations. (F) Chopra

226. Stochastic Structural Dynamics. (3) Three hours of lecture per week. Prerequisites: 225. Intro-duction to the theory of probability and random pro cesses. Correlation and power spectral density functions. Stochastic dynamic analysis of single- and multi-degree-of-freedom structures subjected to stationary and non-stationary random excitations. Time- and frequency-domain analyses; modal cross-
correlations. Response to multi-support excitations. Level crossings, envelope process, first-excitation probability, and distributions of peaks and extremes. Innovative methods and stochastic dynamic analysis. Applications in earthquake, wind, and ocean engineering. Offered odd-numbered years. (F) Der Kruegher

227. Earthquake-Resistant Design. (3) Three hours of lecture per week. Prerequisites: 220 and 225. Design of buildings for earthquake-resistant performance. Seismic design criteria; interpretation of seismic codes; design of structural systems; prediction and evaluation of seismic behavior. Basis for code design procedures. Preliminary design of steel and reinforced concrete structures. Evaluation of earthquake vulnerability of existing structures and rehabilitation of seismic deficiencies. (SP) Mahin, Moehle


C231. Mechanics of Solids. (3) Students will receive no credit for 231A after taking 231A or 231B prior to fall 1992. Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Mechanical response of materials: simple tension in elastic, plastic and viscoelastic members. Continuum mechanics: Theory of elasticity; strain tensors; Thermal, creep, and strain-stress analyses. Applications: plane problems, stress concentrations at defects, metal forming problems. Also listed as Materials Science and Engineering C211. (F) Govindjee

232. Structural Mechanics. (3) Three hours of lecture per week. Prerequisites: 231 or consent of instructor. The goal of this course is to study the theories of structural mechanics within the framework of nonlinear continuum mechanics of solids. Finite elasticity; invariance. Energy principles: principles of virtual and complementary virtual work; primary and mixed variational principles. Continuum mechanics. Theory of stability: Euler method; stability under follower loads. Classical theories of beams: planar, torsional, and lateral buckling. Plate theories. Invariant theories of structural mechanics: directed continuum; Conserat theories of rods. (SP) Armero

233. Computational Mechanics. (3) Three hours of lecture per week. Prerequisites: 222, or consent of instructor. Computational methods for solution of problems in structural mechanics. Finite-element methods for displacement and mixed variational problems of continuum mechanics. Theory of plasticity. Treatment of constraints arising from near incompressibility in solids, transverse shear effects in beams, plates, and shells, and/or contact between structures. Programming methods and implementation. Offered even-numbered years. (F) Armero

234. Computational Inelasticity. (3) Three hours of lecture per week. Prerequisites: 231 or Materials Science and Engineering 211 or Mechanical Engineering 185. Computational methods applied to inelastic deformations of solids; 1-, 2-, and 3-D large and small deformations; plasticity and plasticity models and their algorithmic approximations; viscoplastic regularizations and softening; thermoviscoelasticity and its relationship to algorithmic stability; return mapping methods and yield surfaces; application to metals, soils, concrete, and polymers and incorporation into finite element codes. Offered odd-numbered years. (F) Armero, Govindjee

235. Statistical Mechanics of Elasticity. (3) Three hours of lecture per week. Prerequisites: C231, or Mechanical Engineering 185, or consent of instructor. Introduction to statistical mechanics for engineers interested in the constitutive behavior of matter with a particular interest in continua. Systems of interest will be polymers and crystalline solids. Coverage includes introduction to statistical mechanics, ensembles, phase spaces, partition functions, free energy, polymer chain statistics, polymer networks, harmonic and quasi-harmonic crystalline solids, limitations of classical methods and quantum mechanical influences. Also listed as Mechanical Engineering C279. (F) Govindjee, Papadopoulos

236. Mechanics of Composite Materials. (3) Three hours of lecture per week. Prerequisites: C231, Materials Science and Engineering 211, or consent of instructor. Basic theories, analytical techniques, and mathematical foundations of micromechanics, including: (1) physical micromechanical methods of micromechanics theory of dislocation, and cohesive fracture models; (2) microelasticity that includes Esheilby’s eigenstress theory, comparison variational principles, and micro-crack/ free surfaces; (3) theoretical composite material that includes the main methodologies in evaluating overall material properties; (4) meso-plasticity that includes meso-damage theory, and the microbehavior organization theory for materials with periodic structures. Also listed as Materials Science and Engineering 214. (SP) Govindjee, Li

C237. Computational Nano-mechanics. (3) Three hours of lecture per week and one hour of laboratory every other week. Prerequisites: Graduate standing or consent of instructor. Basic mathematics foundations, physical models, computational formulations and algorithms that are used in nanoscale simulations and modeling. They include: (1) cohesive finite element methods and discontinuous Galerinik methods; (2) meshfree methods, partition of unity methods, and the eXtended finite element methods (X-FEM); (3) quantum mechanics; (4) quantum mechanics; (5) multiscale simulations; and (6) Boltzmann method. Also listed as Nanoscale Science and Engineering 237. Offered in even years. (SP) Li

240. Civil Engineering Materials. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: An undergraduate course in civil engineering materials. Microstructures of concrete, wood, and steel. Differences and similarities in response to loading and environmental effects on these materials, with emphasis on strength, elastic properties, creep, shrinkage, thermal stresses, and failure mechanisms. (F) Monteiro, Ostertag

241. Concrete Technology. (3) Three hours of lecture per week. Prerequisites: 185 or equivalent. Properties of fresh and hardened concrete; strength, elastic behavior, creep, shrinkage, and durability to chemical and physical attacks. New concrete-making materials. Recent advancements in concrete technology: high-strength, high-workability, and high-performance concretes; fiber-reinforced concrete; roller-compacted concrete. (SP) Monteiro

244. Reinforced Concrete Structures. (3) Three hours of lecture per week. Prerequisites: 123. Analysis and design of reinforced concrete elements in bending and shear; design of building and bridge structures, with an emphasis on seismic response and design; structural design methods; reinforced concrete materials; confined concrete; line elements under axial, flexural, and shear loadings; bond, anchorage, and development; seismic design principles; earthquake-resistant building frames, walls, diaphragms, and foundations; earthquake-resistant bridges. (F) Moehle

245. Behavior of Reinforced Concrete. (3) Three hours of lecture per week. Prerequisites: 123 and 220. Advanced topics in reinforced concrete construction, including inelastic flexural behavior; applications of response analysis to design of bridge frames; behavior in shear and torsion; yield-line analysis of slabs; behavior under cyclic and reversed loading; seismic rehabilitation. Offered even-numbered years. (SP) Armero

246. Prestressed Concrete Structures. (3) Three hours of lecture per week. Prerequisites: 244 or consent of instructor. Behavior and design of statically determinate prestressed concrete structures under bending moment, shear, torsion, and axial load effects. Design of continuous prestressed concrete beams, slabs, and slabs, and shells. Time-dependent effects and deflections of prestressed concrete structures. Applications to the design and construction of bridges and buildings. (SP) Filippou, Moehle

247. Design of Steel and Composite Structures. (3) Three hours of lecture per week. Prerequisites: 122 or equivalent. Design and behavior of steel plate girders and shear walls. Design of bracings for structural steel frames. Design of composite beams, columns, and beam-columns. Behavior and design of shear, semi-rigid and moment connections. Concepts used in design of gusset plates and base plates. Selection and design of steel and composite structures. (SP) Armero

248. Behavior and Plastic Design of Steel Structures. (3) Three hours of lecture per week. Prerequisites: 122 or equivalent. Topics related to inelastic behavior and plastic design of steel members and connections. Design of composite beams, columns, and beam-columns. Behavior and design of shear, semi-rigid and moment connections. Concepts used in design of gusset plates and base plates. Selection and design of steel and composite structures. (SP) Armero

249. Experimental Methods in Structural Engineering. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing or consent of instructor. This course covers the following topics: similitude laws, design of structural models, instrumentation and measurement techniques; stress-strain and failure behavior; design of experimental models, including inelastic flexural behavior; bond, anchorage, and development; seismic design principles; earthquake-resistant building frames, walls, diaphragms, and foundations; earthquake-resistant bridges. (F) Moehle

C250N. Transportation Policy and Planning. (3) Three hours of lecture/discussion per week. Prerequisites: C290U or equivalent and consent of instructor. Formerly C290W. Policy issues in urban transportation planning; measuring the performance of transportation systems; the transportation policy formulation process; transportation financing, and subsidy issues; energy and air quality in transportation; specialized transportation for elderly and disabled people; innovations in transportation policy. Also listed as City and Regional Planning C250N. (SP) Moehle

251. Operation of Transportation Facilities. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. The management of vehicle flows and fleets. Traffic stream properties and their measurement. Theories of traffic flow. Cross flow. Capacity analysis. Flow control and fleet scheduling. (F) Cassidy, Daganzo

252. Systems Analysis in Transportation. (3) Three hours of lecture per week. The systems approach and its application to transportation planning and engin...

253. Intelligent Transportation Systems. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. The use of advanced surveillance, navigation, communication, and computer monitoring to improve the performance of transportation systems. Enabling technologies. Application to monitoring, analysis, evaluation, and prediction of transportation system performance and behavior. Intervention strategies. Feasibility studies. Human factors and institutional issues. Case studies. In the laboratory, students carry out a term project under the supervision of an ITS researcher. (S) Skabardonis, Madanat

254. Transportation Economics. (3) Three hours of lecture per week. Prerequisites: 252 or consent of instructor. Application of micro- and macro-economic concepts to transportation systems. Urban and interregional travel demand analysis. Freight demand. Project and program evaluation. Social welfare theory. Analysis of social cost. Investment analysis and pricing theory. Economic impact analysis. Role of economic analysis in decision making. (SP) Hansen, Cassady

255. Highway Traffic Operations. (3) Three hours of lecture per week. Prerequisites: 251 or consent of instructor. Operational planning and management of the highway transportation system. The highway system is presented as a set of operating environments with four distinct environments for analysis and work. Major topics include policy and institutional issues, selection of strategies and tactics, evaluation of objectives, and measures of effectiveness. (SP) Cassidy

256. Transportation Sustainability. (3) Three hours of lecture per week. This multidisciplinary course is intended to introduce students to the fundamentals of sustainable transportation, with an emphasis on: (1) current trends, climate and energy science, and the policy context; (2) methodological and analysis techniques; (3) vehicle technology, fuels, and intelligent transportation systems (ITS) solutions (supply side); and (4) land use, public transportation, and demand management. (F,SP) Horvath

258. Logistics. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Vehicle routing. Transportation-inventory-production interrelationships, physical distribution networks, many-to-many networks (algorithmic role of transportation and logistics research). Transportation and terminals in logistic systems for the transportation of goods and passengers, public and private transportation system design. Relevant methodol-

259. Public Transportation Systems. (3) Three hours of lecture per week. Prerequisites: 251, 252, and 262 (or equivalent course). Analysis of mass trans-

260. Air Transportation. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Nature of air aviation; structure of the airline industry; aircraft characteristics and performance; aircraft configuration and air traffic control; airport planning and design; airline operations; aviation system planning. (F) Hansen, Kanafani

261. Infrastructure Systems Management. (3) Three hours of lecture per week. Prerequisites: 252 or equivalent, 262 or equivalent. Integrated treatment of quantitat-

262. Analysis of Transportation Data. (3) Three hours of session per week. Prerequisites: College calculus or consent of instructor. Probabilistic models in transportation. The use of field data. Data gathering techniques, sources of errors, considerations of sample size, and methods for determining small samples. Transportation operations analysis. (SP) Madanat

263. Operations of Transportation Terminals. (3) Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Characteris-

264. Behavioral Modeling for Engineering, Planning, and Policy Analysis. (3) Three hours of lecture per week. Prerequisites: 262 or City and Regional Planning 204 or equivalent. Many aspects of engineering, planning, and policy involve a human element, be it consumers, businesses, governments, or other organizations. Effective design and manage-

265. Traffic Safety and Injury Control. (3) Three hours of lecture per week. Prerequisites: 262 or equivalent. Formerly 259A. This course applies principles and techniques from the behavioral sciences to the prevention and mitigation of traffic safety problems. The course will cover the role of human behavior in traffic safety, the use of quantitative models and computer simulation to assess performance of different system designs, and the role of policy and institutional factors in traffic safety. (SP) Walker

267F. High-Tech Building and Industrial Con-

268A. Lean Construction Concepts and Methods. (3) Three hours of lecture per week. Prerequisites: Graduate standing in Civil and Environmental En-

268B. Lean Construction and Supply Chain Manage-

268H. Advanced Project Planning and Control. (3) Three hours of lecture per week. Prerequisites: 167. Cost and time estimating and controlling techniques for projects. Evaluation of labor, material, equipment, and subcontractor resources, scheduling techniques, earned value concepts. Measuring project percent complete. Constructability, project portfolio, and project implementation analysis techniques. (SP) Ibbs

268I. Business Fundamentals for Engineers. (3) Three hours of lecture per week. Prerequisites: 167 or equivalent. This course will provide a broad survey of management practices critical to starting and managing a business in the engineering and construction industries. Topics include the entrepreneurial process; organizing and staffing; establishing and acquiring production control systems; means of protecting products and services from competitive threat; and financial management. (SP) Ibbs

268C. Strategic Issues of the Engineering Con-

269T. Formerly 290L. This course will provide an in-depth survey of the key sources of intellectual property and how to protect your ideas, applications, inventions, and innovations. The course will cover the roles of patents, trademarks, copyrights, trade secrets, and other forms of intellectual property protection. (SP) Tommelein

269W. Introduction to Project Management. (3) Three hours of lecture per week. Prerequisites: 267. A general course in project management that covers the fundamentals of project planning, scheduling, and control. The course covers the basic concepts of project management, the role of project managers, and the use of project management tools and techniques. (SP) Ibbs

269X. Applications of Project Management. (3) Three hours of lecture per week. Prerequisites: 267. A course in the advanced practice of project management, focusing on the application of project management techniques and tools to real-world projects. The course covers topics such as project risk management, project cost management, project schedule management, and project communication management. (SP) Ibbs

270. Behavioral Modeling for Engineering, Plan-

277. Advanced Foundation Engineering. (3) Three hours of lecture per week. Prerequisites: 270 or consent of instructor. Formerly 270B. Advanced treatment of topics in soil mechanics, including earth pressure theories, design of earth retaining structures, bearing capacity, ground improvement for foundation support, analysis, and design of shallow and deep foundations. (SP, SY) Bray, Pestana, Seed

278. Engineering Geology. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: A course in physical geology. Influence of geologic origin and history on the engineering characteristics of soils and rocks. Application of geology in exploration, design, and management of earth structures. (SP) Sy, Rector

285C. Seismic Methods in Applied Geophysics. (3) Students will receive no credit for 285C after taking Mineral Engineering 236 before fall 2001. Three hours of lecture per week and two field trips. Prerequisites: C178 or equivalent (introductory course in applied geophysics); Engineering 7 or 77 or equivalent (introductory course in computer programming). Formerly Mineral Engineering 236. This course gives an overview of seismic methods used to image the subsurface. Acquisition, processing, and interpretation of seismic data are discussed, with application to petroleum production, environmental site characterization, earthquake engineering, and groundwater. (SP) Sy, Rector


290. Advanced Special Topics in Civil and Environmental Engineering. (1-3) Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: Consent of instructor. This course covers current topics of interest in civil and environmental engineering. The course content may vary from semester to semester depending upon instructor. (F,SP) Staff

290F. Advanced Topics in Seismology. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Introductory course in seismology; 286 or Mineral Engineering 240. Formerly Mineral Engineering 290C. Active areas of research in applied seismology. Sub-disciplines include waveform and wavefield properties, seismic acquisition, borehole seismology, crosswell seismology, including crosswell seismic tomography, vertical seismic profiling, and reservoir monitoring including passives and active seismic methods. (SP) Sy, Rector

290I. Civil Systems: Control and Information Management. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Mathematical methods and information technologies for controlling CEE systems. Emphasizes designing real-time control systems that can impact the world in real-time to control a large system. Methods applied to transportation operations, supply chains, and structures. Management of design complexity by hierarchical control and computerization. Verification tools, semantics, polymorphism, information management services, and compilation from high-level design languages. (F) Sengupta

290K. Advanced Topics in Geotechnical Engineering. (3) Three hours of lecture per week. Prerequisites: Advanced graduate standing in Geotechnical Engineering. Advanced treatment of developing areas of geomechanics and geotechnical earthquake engineering, including the development of generalized nonlinear soil constitutive models, applications in soil dynamics and geotechnical earthquake engineering, soil improvement, geotechnics and earth structures, and case studies of geotechnical problems. Offered even-numbered years. (F,SP) Bray, Pestana, Seed

290L. Topics in Fluid Mechanics. (1,2) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Lectures on special topics which will be announced at the beginning of each semester that the course is offered. Topics may include transport and mixing, geophysical fluid dynamics, biofluids, free surfaces, Newtonian and non-Newtonian fluid mechanics, among other possibilities. Also listed as Environ Sci, Policy, and Management C291, Physics C290, Mathematics C290C, Chemical Engineering C295M, Mechanical Engineering C298A, and Bioengineering C290C. (F,SP) Staff

290T. Advanced Topics in Transportation Theory. (1) Course may be repeated for credit. One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Selected topics in the mathematical analysis of transportation systems. Topics will vary from year to year. (SP) Cassidy, Daganzo

290U. Transportation and Land Use Planning. (3) Three hours of lecture/discussion per week. Prerequisites: 113A or equivalent. Examination of the interactions between transportation and land use systems; historical perspectives on transportation; characteristics of travel and demand estimation; evaluation of performance models of transportation and urban structure; empirical evidence of transportation-land use impacts; case study examinations. Also listed as City and Regional Planning C290U. (F) Staff

290V. Transportation Finance. (3) Three hours of lecture/discussion per week. This course will explore the economic and financial dimensions of urban transportation systems, including highway finance and user fees, toll financing and congestion pricing, transit finance, air traffic and fare and ticketing systems. Class will review debates over the full social costs of transportation systems and current topics, including the politics of transportation sales taxes. (SP) Staff

290Z. Selected Topics in Air Transportation. (2) Two hours of lecture per week. Prerequisites: 260 (may be taken concurrently). Current developments in air transportation. Topics of current interest, including methods of systems operations analysis, airport capacity and planning, and issues of air transportation policy. (SP) Staff

291F. Control and Optimization of Distributed Parameters Systems. (3) Three hours of lecture per week. Prerequisites: Engineering 77, Mathematics 54 (or equivalent), or consent of instructor. Distributed parameter systems and PDE models of the phenomena of interest, including propagation of waves, network traffic, water distribution, fluid mechanics, electromagnetism, blood vessels, beams, road pavement, structures, etc. Fundamentals of optimization methods and determination of control variables, self-similar solutions, characteristics, numerical methods, spectral methods. Stability analysis. Adjoint-based optimization. Lyapunov stabilization. Differential flatness. Viability control. Hamilton-Jacobi-based control. Also listed as Electrical Engineering C291 and Mechanical Engineering C236. (SP) Staff

291G. Advanced Estimation, Control, and Optimization of Partial Differential Equations. (3) Three hours of lecture per week. Prerequisites: Civil and Environmental Engineering C291, Mechanical Engineering C291/Engineering C298A, or consent of instructor. This course will cover advanced methods in estimation, control, and optimization of distributed parameter systems. (Partial differential equations in particular). The course builds on 291 and covers discrete methods relying on finite differencing such as quadratic programming for optimal control and variational data assimilation, (ensemble extended) Kalman filtering. The course covers distributed transfer function analysis and frequency responses of PDEs, and characteristics-based stability analysis. (SP) Bayen

292A. Technologies for3 Sustainable Societies. (1) Course may be repeated for credit. One to one-half hours of seminar/discussion per week. Offered even-
297. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. One to 12 hours of fieldwork per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Assessment of the consequences and opportunities of various technological systems (such as energy, buildings, transportation, materials, waste management) for sustainable development of projects and programs of political and economic structures of societal decision making. Environmental consequences of various technologies. Metrics and measures. Specific topics vary from year to year according to student and faculty interests. Course meetings include a mix of faculty lectures and student-led seminar presentations. Also listed as Energy and Resources Group C293A. (F, SP) Staff

298. Group Studies, Seminars, or Group Research. (1-12) Course may be repeated for credit. Prerequisites: Graduate standing or consent of instructor, taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduation standing. Supervised experience in off-campus courses relevant to specific aspects of applications of civil and environmental engineering. Written report required at the end of the semester. Course does not satisfy unit or residence requirements for a master’s or doctoral degree. (F, SP) Staff

299. Individual Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Research or investigation in selected advanced subjects. (F, SP) Staff

601. Individual Study for Master’s Students. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. This course may be repeated for the comprehensive or language requirements in consultation with the major field adviser. Units may not be used to meet either unit or residence requirements. (F, SP) Staff

602. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for the comprehensive or language requirements in consultation with the major field adviser. May not be used for unit or residence requirements. (F, SP) Staff

Professional Courses

301. Workshop for Future Civil and Environmental Engineering Teachers. (1-3) Course may be repeated for credit. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Teaching assistant or graduate student status. The course will include supervised teaching of laboratory sections of civil engineering courses, group analysis of videotapes, reciprocal classroom visits, and an individual project. (F, SP) Staff

Classics

Department Office: 7217 Dwinnelle Hall, (510) 642-3164 classics.berkeley.edu
Chair: G.R.F. (John) Ferrari, Ph.D.

Professors
Anthony W. Bullock, Ph.D. Cambridge University. Greek literature, language, culture.
David J. Cohen (The Sidney and Margaret Ancker Professor in Rhetoric and Classics). Ph.D. Cambridge University. J.D. University of California, Los Angeles. Ancient rhetoric, classical Greek, political and legal theory.
Susanna Elm, D.Phi. Oxford University. History of late antiquity, early Christianity
G. R. F. (John) Ferrari, Ph.D. Cambridge University. Ancient philosophy and literature
Mark Griffith (The Klio Distinguished Professor of Classical Languages and Literature). Ph.D. Cambridge University. Greek and Roman literature and civilization
Leslie V. Kurke (The Richard and Rhoda Goldman Distinguished Professor, Professor of Classics and Comparative Literature). Ph.D. Princeton University. Greek literature and cultural history
Anthony A. Long (The Irving Stone Professor of Literature). Ph.D. University of London. Ancient philosophy and Greek literature
Donald J. Mastronarde (The Melpmene Distinguished Professor of Classical Languages and Literature). Ph.D. University of Michigan. Roman literature
J. Theodore Peña, Ph.D. University of Michigan. Roman archaeology, ancient art, material culture, style, and archaeometry
Andrew F. Stewart (The Nicholas C. Pecas Professor in Greek Studies). Ph.D. Cambridge University. Greek sculpture, ancient art, architecture
* Crawford H. Greenewalt Jr. (Emeritus). Ph.D.
* Ehrich S. Gruen (Emeritus). Ph.D.
* Ralph J. Hexter ( Emeritus). Ph.D.
* Robert C. Knapp (Emeritus). Ph.D.
* Stephen G. Miller (Emeritus). Ph.D.
* Charles E. Murphy (Emeritus). Ph.D.
* Michael N. Nagler (Emeritus). Ph.D.
* Ronald S. Strowd (Emeritus), Ph.D.
* Leslie L. Tetreau (Emeritus), Ph.D.

Associate Professors
Christopher Hallet, Ph.D. University of California, Berkeley. Roman art and material culture
Kathleen McCarthy, Ph.D. Princeton University. Roman literature and culture
Trevor Murphy, Ph.D. University of California, Berkeley. Roman prose authorship
Ellen Olesnieks, Ph.D. Yale University. Roman literature and culture
Sayan Sanyal, Ph.D. University of California, Berkeley. Roman literature and culture, ancient historiography, Roman rhetoric
Florence Verducci (Emeritus). Ph.D.

Assistant Professors
Frank Beazner, Ph.D. University of Tübingen. Classics and comparative literature, Medieval Latin literature, and literary culture
Sumi Funjii, Ph.D. Harvard University. Roman literature
Todd Hickey, Ph.D. University of Chicago. Greek and Egyptian papyrology, paleography, late antiquity
Nikolaos Paparakazdas, D.Phi. Oxford University. Greek epigraphy, Greek history
Kim Shelton (Director, Nemea Center for Classical Archaeology). University of Pennsylvania. Bronze Age, archaeology

Sather Professors
2007-08, Helen Foley
2008-09, Mary Beard
2009-10, Heinrich von Staden
2010-11, Alessandro Barchiesi

Visiting Professor
Maurizio Bettini

Major Advisers: (Greek, Latin, Classical Languages, Classical Civilizations)
Prof. Furiya, Prof. Paparakazdas
Graduate Advisers: (Classics), Prof. Kurke; (Classical Archaeology), Prof. Peña

Department Overview

The Department of Classics offers a complete undergraduate and graduate program in Greek and Latin languages, literatures, and civilizations. It groups its courses of instruction under the headings of Greek, Latin, and classics. The study of the Greek and Latin courses is to teach undergraduates to read major works of ancient literature in the original languages and to give a general understanding of the achievements of classical civilization. The purpose of the classics undergraduate courses is to provide instruction in Greek and Roman civilization in all its aspects—literature (including translation), philosophy, religion, social and political life, and archaeology. The latter courses require no knowledge of Greek and Latin. The graduate courses, all of which are designed as classics courses, provide a background in Greek, Latin, and classical archaeology, and require knowledge of both languages.

The Majors

The Department of Classics offers four undergraduate majors: Greek, Latin, classical languages, and classical civilizations. Students considering any of these majors should consult with the department undergraduate adviser as early as possible.

Major in Classical Civilizations. Lists of courses approved to meet the requirements described on the department website at time of printing. Students considering any of these majors should consult with the department undergraduate adviser as early as possible.

(a) Area of concentration: five courses (at least three must be in the Classics department) in one of the following areas of concentration: Classical Art and Archaeology (five upper division courses from a list of selected courses); Classical History and Culture (five upper division courses from a list of selected courses); Greek Language (five Greek courses including up to two lower division); Latin Language (five Latin courses including up to two lower division). Visit the department website for a list of acceptable courses.

(b) Area of breadth: two courses from any combination of upper and lower division offerings in a approved Roman pre-industrial culture (consult with the classics faculty and undergraduate adviser in selecting these courses).

(c) Area of concentration: five courses (at least three must be in the Classics department) in one of the following areas of concentration: Classical Art and Archaeology (five upper division courses from a list of selected courses); Classical History and Culture (five upper division courses from a list of selected courses); Greek Language (five Greek courses including up to two lower division); Latin Language (five Latin courses including up to two lower division). Visit the department website for a list of acceptable courses.

(d) Area of breadth: two courses from any combination of upper and lower division offerings in a approved Roman pre-industrial culture (consult with the classics faculty and undergraduate adviser in selecting these courses).

(e) Two additional upper division courses from a list of selected courses without duplication from the other requirements; all students in this major must take Classics 130.

Major in Classical Languages. Elementary Greek (either Greek 1-2 or Greek 10 or the Greek Workshop, offered during Summer Sessions); Elementary Latin (either Latin 1-2 or Latin 10 or the Latin Workshop, offered during Summer Sessions); Greek 104, Latin 104 (to be taken concurrently with upper division courses); Greek 101, 102, and 104: two courses chosen from Greek 115-123; Classics 10A and 10B: courses at time of printing. Students considering any of these majors should consult with the department undergraduate adviser as early as possible.

Major in Greek. Elementary Greek (either Greek 1-2 or Greek 10 or the Greek Workshop, offered during Summer Sessions); Greek 104 (to be taken concurrently with upper division courses); Greek 101, 102, and 104: two courses chosen from Greek 115-123; Classics 10A and 10B: courses at time of printing. Students considering any of these majors should consult with the department undergraduate adviser as early as possible.

Major in Latin. Elementary Latin (either Latin 1-2 or Latin 10 or the Latin Workshop, offered during Summer Sessions); Latin 40 (to be taken concurrently with upper division courses); Latin 100, 101, and 102: four courses chosen from Latin 115-140; Classics 10A and 10B (under exceptional circumstances, the undergraduate adviser may authorize substitution of Classics 100A for 10A, 100B for 10B); one course from the list of recommended courses available in the department office and on its website. Students considering any of these majors should consult with the department undergraduate adviser as early as possible.
Substitutions. Under exceptional circumstances the undergraduate adviser is empowered to authorize a substitution of a more advanced reading course for any required reading course numbered 100 to 102, if such substitution is deemed necessary and advisable.

Honors Program. Restricted to majors with an overall University GPA of at least 3.5 and a GPA of at least 3.3 in the major. Consists of: (1) one of the major programs, with the added requirement for students in the Greek, Latin, and classical languages majors that at least one of the senior reading courses in the major must be in prose and at least one must be in poetry; (2) one semester of Greek H195 (for Greek or classical languages majors), Latin H195 (for Latin or classical languages majors), or Classics H196 (for classical civilizations majors); H195 consists of largely independent study, including the writing of a thesis; the project undertaken in this one-semester honors course (4 units) must be related to work completed in a previous upper division course in the Department of Classics. The thesis will be evaluated by an honors committee of three members. The deadline for submission of a thesis is due on Monday of the 13th week of the semester and the committee will agree upon the level of Honors (Honors, High Honors, or Highest Honors) and the grade to be awarded no later than the Monday of examination week.

The Minors
Minor in Classical Civilization. Five upper division courses in the Classics department. Courses or seminars taught by Classics professors in other departments may also be accepted, in consultation with the undergraduate faculty adviser.

Minor in Greek Studies. Five upper division courses in Greek language and related courses. At least three courses must be in the Greek language; up to two courses may be in courses with substantial content relevant to Greek literature, philosophy, culture, or history.

Minor in Latin Studies. Five upper division courses in Latin language and related courses. At least three courses must be in the Latin language; up to two courses may be in courses with substantial content relevant to Roman literature, philosophy, culture, or history.

Preparation for Graduate Study
To enter graduate study in classics, students should complete the major in classical languages (or a satisfactory equivalent). Students are urged to supplement the requirements for the major with two or three senior reading courses (Greek 115-123, Latin 115-123 ). They are strongly advised also to have an adequate reading knowledge of Greek and/or Latin, which is best accomplished if possible, since they must pass examinations in two of these languages for the Ph.D. degree and in one of them for the M.A. degree. Prospective graduate students are encouraged to take the Advanced Prose Composition in Greek and Latin (Classics 250, 260) since the graduate program requires demonstration of competence in prose composition. Note: The major in classical civilizations is not considered to be adequate preparation for graduate study.

The Graduate Program
The Master of Arts degree may be taken in classics (under Plan B: a program of 24 units in graduate and advanced undergraduate courses, and a series of examinations) or classical archaeology (under Plan A: a program of 20 units of graduate and advanced undergraduate courses, and a thesis). The Doctor of Philosophy degree may be taken in classics or classical archaeology. Whatever the graduate students’ principal interest—litigation, history, or archaeology, or other subjects—they should take a broad program and acquaint themselves with every field of classical study. Students are advised to read widely Greek and Latin authors and Latin H195 and Ph.D. regulations require an extensive knowledge of literature, history, and philosophy. They are also encouraged to take courses in epigraphy, comparative grammar, and Greek dialects when they are offered, since the interval between offerings of each can be three years. The graduate course offerings are varied from year to year so that in a normal period of graduate study students may take courses in several fields and periods. Service for two semesters as a graduate student instructor is normally required as part of the Ph.D. program in classics. Most seminars may be taken for either 4 units (for a letter grade) or 2 units (on a satisfactory/unsatisfactory basis), subject to some restrictions. For details of the M.A. and Ph.D. programs, consult the graduate adviser.

Undergraduate Courses

Classics
Courses that do not require a knowledge of Greek or Latin. (Classics 110 is an exception.) Courses in this group are designated Classics 10A, 10B, etc.

Lower Division Courses
10A. Introduction to Greek Civilization. (4) Three hours of lecture and one hour of discussion per week. Study of the major developments, achievements, and contradictions of Greek culture from the Bronze Age to the 4th century BCE. Key works of literature, history, and philosophy (read in English translation) will be examined in their political and social context, and in relation both to other ancient Mediterranean cultures and to subsequent developments in Western civilization. (F)

10B. Introduction to Roman Civilization. (4) Three hours of lecture per week; one hour of discussion may be added. Investigation of the main achievements and tensions in Roman culture from Romulus to the High Empire. Key sources for literature, history, and material culture are studied in order to reveal Roman civilization in its classical social context. All materials are read in English. (F,SP)

17A. Introduction to the Archaeology of the Greek World. (4) Three hours of lecture and one hour of discussion per week. The physical remains of the Greek world from the Bronze Age to 323 BCE will be studied. Most seminars may be taken for either 4 units (for a letter grade) or 2 units (on a satisfactory/unsatisfactory basis), subject to some restrictions. For details of the M.A. and Ph.D. programs, consult the graduate adviser.

17B. Introduction to the Archaeology of the Late Greek and Roman World. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Greek 10A or 10B. The physical remains of the Hellenistic and Roman worlds from 323 BCE to the advent of Christianity will be studied as a means of understanding the culture of ancient Greece. (F)

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-8 to be graded on a letter-grade basis. Sections 9-16 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to give freshmen and sophomores an opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F,SP)

28. The Classic Myths. (4) Three hours of lecture and one hour of discussion per week. A study of Greek and Roman myths with emphasis on the universal meanings of myths. The role of myths in religion, art, and philosophy as a source of understanding of ancient and present cultures. (F,SP)

29. Introduction to Greco-Roman Magic. (3) Three hours of lecture per week. Study of magical practices in the Greek and Roman worlds during the historical period (c. 750 BCE through the 5th century CE) and in classical popular culture. Consideration is given to ways of analyzing and understanding magical practices, and the relationship between magic, religion, philosophy, and science. (F,SP)

34. Epic Poetry: Homer and Vergil. (4) Three hours of lecture per week. A discussion section may be added. Greek and Roman epics including the Iliad, Odyssey, Aeneid. (F,SP)

35. Greek Tragedy. (4) Three hours of lecture/discussion per week. Greek tragedy with readings of Aeschylus, Sophocles, and Euripides. (F,SP)

36. Greek Philosophy. (4) Three hours of lecture/discussion per week. Introduction to the philosophies of Socrates, Plato, and Aristotle. Prerequisites: Prior knowledge of Greek or Latin required; but provision will be made for students in the Greek, Latin, and classical language (for students in the Greek, Latin, and classical language). Three hours of lecture and one hour of discussion per week. Prerequisites: Restricted to freshmen and sophomores; consent of instructor; 2.3 overall GPA. (F,SP)

99. Supervised Independent Study and Research. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor; 2.3 overall GPA. (F,SP)

Upper Division Courses

110. Ancient Metrics. (2) Two hours of lecture per week. Prerequisites: Greek 2 or 10. The principles of all metre types of all ages are studied. (F,SP)

121. Ancient Religion. (4) Course may be repeated with consent of instructor as topic varies. Three hours of lecture per week. Topics may include study of the worship of gods in the ancient Greek world, cult practices and religious ideas; history and development of Roman religion.

124. Classical Poetics. (4) Three hours of lecture per week. Study of a selection (in English translation) of the most important works of classical antiquity that theorize about literature and of the works of some post-classical authors who wrote on similar themes under the influence of their classical predecessors. Authors studied may include Plato, Aristotle, Horace, Longinus, Augustine, Sidney, Pope, and Lessing. (F,SP)

130. Topics in Ancient Greek and Roman Culture. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division status.
Study of topics in gender, feminism, and sexuality in ancient cultures. Topics vary from year to year. (F,SP)

163. Topics in Greek Philosophy. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 36 or Philosophy 254 or consent of instructor. The course is designed to deal with a single topic or selection of topics in Greek philosophy studied in translation. Possible topics are the close study of one or more of Plato's or Aristotle's texts. Helenistic philosophy, neo-Patonism.

170. Classical Archaeology. Three hours of lecture per week. (F,SP)
170A. Greek Vase Painting. (4)
170B. Greek Sculpture to 400 BCE. (4)
170C. Greek Architecture. (4)
170D. Roman Art and Architecture. (4)

175. Topography and Monuments. Three hours of lecture per week. (F,SP)
175A. Athens. (4)
175C. Sanctuaries of Greece. (4)
175D. Pompeii and Herculanenum. (4)
175F. Roman Wall Painting. (4)

H195. Honors Course in Classical Civilization. (4) Three hours of work per week per unit. Prerequisites: Appropriate preparation and eligibility for admission to the Honors College. An independently independent study for one semester building on work in a previous upper division course used in fulfillment of the classical language or classical civilizations major; the work will result in the writing of a thesis, to be evaluated by an honors committee of three members. Written thesis due the Monday of the 13th week of the semester in which the course is taken. (F,SP)

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honors students. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honors students. (F,SP)

Greek

Courses in this group are designated Greek 1, 2, etc.

Lower Division Courses

1. Elementary Greek. (4) Four hours of lecture per week. Beginners' course. (F,SP)

2. Elementary Greek. (4) Four hours of lecture per week. Prerequisites: 1 or equivalent. Beginners' course. (F,SP)

10. Intensive Elementary Greek. (8) Five hours of lecture per week. Beginners' course (intensive); equivalent to Latin 1-2. (F,SP)

40. Intermediate Greek Prose Composition. (4) Three hours of lecture per week. Prerequisites: 2, 10, or 15. Formerly Greek 40A. Development of skills in writing Attic prose and sight reading; grammar

98. Directed Group Study for Freshmen and Sophomores. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor; 3.3 overall GPA. (F,SP)

99. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honors students. (F,SP)

Latin

Courses in this group are designated Latin 1, 2, 40, etc.

Lower Division Courses

1. Elementary Latin. (3) Three or four hours of lecture per week. Beginners' course. (F,SP)

2. Elementary Latin. (4) Three to four hours of lecture per week. Prerequisites: 1 or equivalent. Beginners' course. (F,SP)

10. Intensive Elementary Latin. (8) Five hours of lecture and one hour of discussion per week. Beginners' course (intensive); equivalent to Latin 1-2. (F,SP)

40. Intermediate Latin Prose Composition. (4) Three hours of lecture per week. Prerequisites: 2, 10, or 15. Formerly Latin 40A. Development of skills in writing Latin prose and sight reading; review of grammar. (SP)

98. Directed Group Study for Freshmen and Sophomores. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor; 3.3 overall GPA; restricted to freshmen and sophomores. (F,SP)

99. Supervised Independent Study and Research. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and 3.3 overall GPA; restricted to freshmen and sophomores. (F,SP)

Upper Division Courses

100. Plato and Attic Prose. (4) Three hours of lecture per week. Prerequisites: 2, 10, or 15. Readings from Plato’s Apology or Crito, and from other Attic prose authors (e.g., Xenophon, Lysias); some review of grammar. (F)

101. Homer. (3) Three hours of lecture per week. Prerequisites: 12, 10, or 15. Selected readings in the Iliad or Odyssey. (SP)

102. Drama and Society. (4) Three hours of lecture per week. Prerequisites: 100. Formerly Greek 103. Reading of one Greek tragedy, and of further selections from the dramatists and/or prose literature of fifth-century Athens. (F)


115. Archai Poetics. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Readings in various Greek poets.

116. Greek Drama. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Selected readings from Greek tragedy and/or comedy.

117. Hellenistic Poets. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 101 or 102. Readings in various Hellenistic poets.

120. Herodotus. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in Herodotus.

121. Thucydides. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in Thucydides.

122. Attic Oratory. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in oratory.

123. Plato and Aristotle. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Greek 100 and either 101 or 102 or 105. Readings in Plato and Aristotle.

125. Greek Literature of the Hellenistic and Imperial Periods. (4) Course may be repeated for credit with consent of instructor as topic varies. Three hours of lecture per week. Prerequisites: 100, and either 101, 102, or 105. Selected readings in Greek prose or poetry written by authors active during the Hellenistic Age and the Roman Empire (3rd century BCE to 6th century CE). (F,SP) Hickey

H195. Honors Course in Greek. (3) Three hours of work per week per unit. Prerequisites: Appropriate language preparation and eligibility for admission to the honors program. Largely independent study for one semester building on work in a previous upper division course used in fulfillment of the Greek major; the work will result in the writing of a thesis, to be evaluated by an honors committee of three members. Written thesis due the Monday of the 13th week of the semester in which the course is taken. (F,SP)

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior honors students. (F,SP)

100. Republican Prose. (4) Three hours of lecture per week. Prerequisites: 2, 10, or 15. Selected readings in Caesar, Sallust, and Cicero; some review of grammar. (F,SP)

101. Vergil. (3) Three hours of lecture per week. Prerequisites: 100. Selected readings from Vergil. (F,SP)

102. Lyric and Society. (4) Three hours of lecture per week. Prerequisites: 100. Reading in Catullus and Horace, and of short selections from prose literature of their periods. (SP)

115. Roman Drama. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in comedy (Plautus and/or Terence) and tragedy (Seneca).

116. Lucretius, Vergil’s Georgics. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in the De Rerum Natura and the Georgics.

117. Elegiac Poetry. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in Propertius, Tibullus, and Ovid.

119. Latin Epic. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101 or 102. Readings in Latin epic poetry.

120. Latin Prose to AD 14. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 100 and either 101 or 102 or 140. Readings in Latin prose authors such as Sallust, Cicero, Caesar, and Livy.

121. Tacitus. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101 or 102 or 140. Readings in Tacitus.

122. Post-Augustan Prose. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 100 and either 101 or 102 or 140. Readings in Seneca, the younger Pliny, and other prose writers.
Classics

The proseminar (Classics 200) is prerequisite to all graduate seminars; this requirement does not apply to graduate courses that are not seminars proper (Classics 21A-21B, 230A-230B, 222, 223, 250, 260), and it may be waived only with special permission of the graduate adviser.

Courses vary from year to year and are not necessarily given in alternate years.

200. Proseminar. (4) Three hours of seminar per week. An introduction to the general literature of classical civilization, methods of research, and textual criticism. (F)

201A-201B. Survey of Greek Literature. (4-4) Three hours of lecture per week. A sequence of readings and lectures on Greek literature. Offered alternate years. (F,SP)

202A-202B. Survey of Latin Literature. (4-4) Three hours of lecture per week. A sequence of readings and lectures on Latin literature. Offered alternate years. (F,SP)

203. Approaches to Classical Literature. (4) Three hours of seminar per week. Prerequisites: 200 or consent of instructor. Introduction to basic methods of literary criticism and interpretation, and study of particular critical approaches of significance for the understanding of classical literature. Close reading of selected passages of Greek and Latin will be emphasized. The critical approaches that are to be studied may vary from year to year. The course will be team taught. (F)

204. Proseminar in Classical Archaeology and Ancient Art. (4) Three hours of seminar per week. This seminar is intended to introduce graduate students—both archaeologists and non-archaeologists—to the discipline of classical archaeology, history, and evolution, and its research tools and bibliography. Since it is both impossible and undesirable to attempt to cover the entire discipline in one semester, after two introductory lectures on the history of the field, we will address a selection of topics that seem representative of its concerns. Also listed as History of Art 204. (SP) Hallinan taught.

211. Archetypal Poetry (2-4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 210C-D. Topics in Waldeian, elegiac, and lyric poems from Archilochus to Pindar.

213. Hellenistic Poetry. (2-4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 210E. Study of Callimachus, Theocritus, Apollonius, or other topics in Hellenistic poetry and poetics.

214. Greek Drama. (2-4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 215A-E. Study of Aeschylus, Sophocles, Euripides, Aristophanes, Menander, or other topics in Greek drama and dramatic theory.

218. Greek Philosophers. (2-4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units taken on a letter-grade basis. Prerequisites: 200. Formerly 210D. Plato, Aristotle, Hellenistic Philosophy, or other topics in ancient Greek philosophy through Plotinus. (F,SP)

219. Ancient Novel. (2-4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Study of Greek novelists, Petronius, Apuleius, or other topics in Greco-Roman romance or novel.

220A. Greek and Latin Epigraphy. (2-4) Three hours of lecture per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. A. Greek epigraphy. B. Latin epigraphy.

222. Comparative and Historical Grammar of Greek. (2,4) Three hours of lecture per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 210F. Study of ancient Greek phonology, morphology, and syntax will be examined, of the evolution of Greek from its reconstructed ancestor, Proto-Indo-European, through its dialects as attested in antiquity. The development of Greek phonology, morphology, and syntax will be examined, and linguistic characteristics of a few literary and epigraphic dialects will be compared.

225. Papyrology. (2-4) Course may be repeated for credit. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Study of Berkeley’s outstanding collection of papyri in antiquity, education, etc.). Extensive use will be made of Berkeley’s outstanding collection of papyri from Tebtunis.

226. Myth and Literature. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. The course introduces students to Greek papyrology. Its principal aim is to develop the skills necessary to edit and interpret papyrological texts. Sessions are devoted to learning the basic methodology and investigating historical issues to which the papyrological corpus has much to contribute (the ancient economy, gender in antiquity, education, etc.). Extensive use will be made of Berkeley’s outstanding collection of papyri from Tebtunis.

227. Ancient Society and Law. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. The course explores the interplay of mythical thinking and formal literary expression in texts of all kinds in the Greco-Roman world.

228. Ancient Society and Law. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 228. Study of social, legal, or administrative structures in Greek or Roman world.

230. Latin Poetry of the Republic and Early Empire. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 230B. Study of Petronius, Vergil, Horace, Ovid, or other topics in Latin poetry from Ennius to Juvenal.

235. Latin Philosophers. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Formerly 235A. Study of Cicero, Seneca, or other topics in the history of Roman philosophy.

239. Topics in Greek or Roman Literature, History, and Culture. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. Prerequisites: 200. Select issues in ancient Greek and/or Roman literature or history or culture. (F,SP) Staff.

250. Advanced Greek Composition. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Greek 40 or equivalent. Advanced instruction in the writing of Greek prose.

256. Advanced Latin Composition. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Latin 40 or equivalent. Advanced instruction in the writing of Latin prose.

270. Seminar in Classical Archaeology. (2,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. 2 units to be graded on a satisfactory/unsatisfactory basis. Advanced study of ancient Greek art objects and sites.

279. Field Study in Archaeology. (2-12) Course may be repeated for a maximum of 15 units. Supervised study in archaeology.

288. Special Study. (2-12) Course may be repeated for credit. Prerequisites: Approval by the student’s adviser. May be used for unit or residence requirements for the doctoral degree. (F,SP)

299. Special Study. (1-4) Course may be repeated for credit. Special individual study for qualified graduate students. (F,SP)

601. Individual Study for Master’s Candidates. (1-15) Course may be repeated for credit on a satisfactory/unsatisfactory basis. Individual study for the comprehensive or language requirements in consultation with the graduate adviser or personal advisor. Units may not be used to meet either unit or residence requirements for the master’s degree. (F,SP)

602. Individual Study for Doctoral Candidates. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the graduate adviser or personal advisor to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)

Professional Courses

300. Teaching of Classics: Methods and Problems. (3) Course may be repeated for credit. Four two-hour seminars per term plus individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or GSI status. Seminar in problems of teaching. Required for all new graduate students. (F,SP) A. Staff.

302. Teaching Practicum. (3-6) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Supervised teaching of lower division Greek, Latin, or Classics or of discussion sections in Classics. Two
Cognitive Science
(College of Letters and Science)

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Lynn Robertson (Psychology)
Eleanor Rosch (Psychology)
Stuart Russell (Computer Science)
Geoffrey Strange (Integrative Biology)
Alan Schoenfeld (Education/Mathematics)
*John Searle (Philosophy)
*Arthur Shimamura (Psychology)
Roger Silverman (Psychology)
Robb Willer (Social)
*Hubert Dreyfus (Philosophy Emeritus)
Susan Ervyn-Tripp (Psychology Emeritus)
Jerome Feldman (Computer Science Emeritus)
Charles Fillmore (Linguistics Emeritus)
*Evim Haffner (Psychology Emeritus)
Paul Kay (Linguistics Emeritus)
John Ohala (Linguistics Emeritus)
*Stephen Palmer (Psychology Emeritus)
Dan Slobin (Psychology Emeritus)
Robert Wlenksy (Computer Science Emeritus)
*Lolka Zadeh (Computer Science Emeritus)

Student Academic Adviser: Carol Snow

Group Major in Cognitive Science

Cognitive science is the cross-disciplinary study of the structure and processes of human cognition and their computational simulation or modeling. This interdisciplinary program is designed to give students an understanding of questions dealing with human cognition, such as concept formation, visual perception, the acquisition and processing of natural language, and human reasoning and problem solving.

The program draws on relevant courses found within the fields of anthropology, biology, computer science, education, linguistics, philosophy, and psychology, as well as specially designated lower and upper division courses in cognitive science. The structure of the major follows.

Prerequisites for the Major.
Cognitive Science C1/Education C1, Computer Science 61A or Engineering 7, and Mathematics 1A or 16A.

Lower Division Requirements.
Mathematics 55 or Computer Science 70, and Molecular and Cell Biology 61.

Upper Division Core Requirements.
Cognitive Science C100/Psychology C120 and Cognitive Science C101/Linguistics C105.

Distribution. All students must complete one course from each of the following six areas, plus one additional from any of the areas:

- Cognitive neuroscience: Psychology 117 or Psychology C127/Cognitive Science C127.
- Cognitive psychology: Psychology 122; Psychology/Cognitive Science C122/Cognitive Science C128; Psychology C129/Cognitive Science C102; Psychology 143 or 164.
- Computational modeling: Cognitive Science C131/Psychology C123 or Computer Science 188.
- Linguistics: Linguistics 100.
- Philosophy: Philosophy 122, 131, 132, 133, 135, or 136.
- Society, culture, and cognition: CogSci C103/History C192/Info C103/Media Studies C104/Cognitive Science C104/Linguistics C104; Economics 119; Anthropology 196; Education 140AC/Linguistics 150; Psychology 107, 164, 166AC; or Sociology 150.

All students must complete a minimum of 30 upper division units in cognitive science.

Concentration. Cognitive science students who have completed the major requirements may wish to add an option. All courses taken toward the required 30 upper division units may be applied toward a concentration if they fall into the appropriate categories as described below.

- Cognitive neuroscience. Students concentrating in cognitive neuroscience must take Psychology 117 or Psychology C127, one course from the following: Molecular and Cell Biology C160/Neuroscience C160, or Integrative Biology 240/245L, and a third course. Additional courses include: Psychology 110, 111, 112, 114, 117; Cognitive Science/Psychology C127/Cognitive Science C133; Molecular and Cell Biology C160/Neuroscience C160, 160L, 163, 164, 165, 166; Cognitive Science C110/Cognitive Science C112/Linguistics C109.

- Cognitive psychology. Students concentrating in cognitive psychology must take Psychology 101; one course from the core courses list: Psychology 122, 143; Psychology/Cognitive Science C124, C126; Psychology C129/Cognitive Science C102; Psychology 164, and a third course. Additional courses include Psychology 107, 111, 112, 121; Psychology/Cognitive Science C127; Psychology 133, 142; Music 108; Education 224A, 227, 229A/Psychology C223.

- Computational modeling. Students concentrating in computational modeling must take Cognitive Science C131/Psychology C123 or Computer Science 188, and two courses from the following list: Computer Science 61B; Cognitive Science C182/Cognitive Science C110/Linguistics C109; Computer Science 160, 170, 186, 220V/ Vision Science 2580, 281, 287, 288, 289.

- Linguistics. Students concentrating in linguistics must take Linguistics 100; either Linguistics 110 or 120, and a third course. Additional courses include Linguistics C104/Cognitive Science C104, Linguistics 106; Linguistics/Cognitive Science C107, C108; Linguistics C109/Cognitive Science C110/Computer Science C182; Linguistics/Cognitive Science C142; Linguistics/Cognitive Science C147; Linguistics C160/Cognitive Science C140; Cognitive Science 115, 121, 123, 158; Philosophy/Linguistics/Cognitive Science C124, Psychology 143.

- Philosophy. Students concentrating in philosophy must take Philosophy 132 and two other courses, at least one of which must come from the core courses list: Philosophy 100, 122, 131, 132, 133, 135, 136, 137, 139; Advanced additional courses include: Philosophy 128, 130, 140A,B, 174, 175, 176, 178, 185, 186A, B, 188; Cognitive Science/Linguistics C108.

- Society, culture, and cognition. Students concentrating in society, culture, and cognition must complete at least three courses, one of which must come from the core courses list: CogSci C103/History C192/Info C103/Media Studies C104/Cognitive Science C104/Linguistics C104; Economics 119; Anthropology 196; Education 140AC/Linguistics 150; Psychology 107, 164, 166AC; Sociology 150. Additional courses include: Anthropology 160AC, 161, 163; Information 142AC, 146, 182A; Media Studies 102/Information 141; Linguistics 150AC, 130, 151, 170; Linguistics/Slavic C139; Media Studies 10, 101, 102, 160, 170; Native American Studies 151; Philosophy 153; Political Science 161, 164A; Psychology 125AC, 167AC; Rhetoric 103A, 105, 110, 170, 174, 175, 177; Sociology 119, 156.

Honors Program. Cognitive science majors who wish to graduate with honors must have an overall GPA of 3.30 or higher in all work completed at the University, and a 3.50 or higher in the major program at the time of their graduation. In addition, they must complete a thesis of high quality, based upon independent study with a member of the cognitive science faculty and approved by the satisfactory completion of at least 3 units of course H195A-H195B or 199.

Students interested in the major should consult with the student affairs officer in 243 Evans Hall, (510) 642-2628.

Lower Division Courses

INTRODUCTION TO COGNITIVE SCIENCE. (4) Three hours of lecture and two hours of laboratory per week. Formerly 1. This course introduces students to the field of cognitive science. Lectures and readings will survey research from artificial intelligence, psychology, linguistics, philosophy, and neuroscience, and will cover topics such as knowledge, thinking, remembering, vision, imagery, language, and consciousness. Sections will demonstrate some of the major methodologies. Also listed as Education C1. (F,SP) Ranney. 84.

Sophomore Seminar. (1,2) Course may be repeated for credit. One hour of seminar per week per unit for 10 weeks. Enrollment limited to 15 sophomores.

Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.

Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores; consent of instructor. Independent study and research by arrangement with faculty. (F,SP) Staff.

Upper Division Courses

Cognitive Science Major, Philosophy Concentration. (3) Students will receive no credit for C120 after taking 120A. Two hours of lecture and one hour of discussion per week. Theoretical foundations and current controversies in cognitive science will be basic issues in cognition—including perception, imagery, memory, categorization, thinking, judgment, and development—will be considered from the perspectives of philosophy, psychology, computer science, and physiology. Particular emphasis will be placed on the nature, impli-
cations, and limitations of the computational model of mind. Also listed as Psychology C120. (F)

C101. The Mind and Language. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper level undergraduate. Formerly Information Systems and Management C103. This course explores the history of information and associated technologies, uncovering why we think of ours as “the information age.” We will select moments in the evolution of production, recording, and sharing information in the world of short message service (SMS) and blogs. In every instance, we’ll be concerned with both what and when and why and how, and we will keep returning to the question of how do technological developments affect society and vice versa? Also listed as Media Studies C104C, History C192, and Information C103. (F,SP) Duguid, Nunberg

C104. The Mind, Language, and Politics. (4) Three hours of lecture and one hour of discussion per week. An analysis of contemporary liberal and conservative thought and language, in terms of the basic mechanisms of mind: frames, prototypes, radical categories, contested concepts, conceptual metaphor, metonymy, and blends. The framing of political discourse. The logic of political thought. The purpose of the course is to provide students interested in political and social issues with the tools to analyze the framing of, and logic of contemporary political discourse. Also listed as Linguistics C104. G. Lakoff

C108. The Challenge of Cognitive Science to Western Philosophy. (4) Three hours of lecture/discussion per week. Prerequisites: Some background in either cognitive science or philosophy. Three major results from cognitive science are inconsistent with most of Western philosophy: the embodiment of mind, the cognitive unconscious, and metaphorical thought. The course rethinks philosophy from a cognitive science perspective. Basic philosophical concepts—time events, causation, the mind, the self, and morality—and the cognitive structure of the philosophical theories of the Presocratics, Plato, Aristotle, Descartes, Kant, analytic philosophy (especially Quine), and Chomsky. Also listed as Linguistics C108. G. Lakoff

C110. The neural basis of language. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Computer Science 61B; and Linguistics C105 or C106, Psychology C120B; or consent of instructor. This is a course on the current status of interdisciplinary studies that seeks to answer the following questions: (1) How is it possible for the human brain, which is highly structured network of neurons, to learn, use, and understand language? (2) How are language and thought related to perception, motor control, and our other neural systems, including social cognition? (3) How do the computational properties of neural systems’ and specific neural structures of the human brain shape the nature of thought and language? Much of the course will focus on the neural Theory of Language (NTL), which seeks to answer these questions in terms of architecture and mechanism, using models and simulations of language and learning phenomena. Also listed as Linguistics C109. (SP)

C124. Psycholinguistics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: An introductory course in linguistics or consent of instructor. Introduction to psycholinguistics, emphasizing effects of psychological variables on the learning and use of language, influence of language behavior on psychological processes; special attention to psychological modifiability of mental linguistic theory and to social psychological aspects of language behavior. Also listed as Psychology C124.

C126. Perception. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Psych 101 recommended. An introduction to psychological constructs and experimental procedures in visual and auditory perception. Topics will include psychophysics; perception of color, space, and shape; motion perception and perceptual attention. Also listed as Psychology C126.

C127. Cognitive Neuroscience. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Psychology 110 or C120, or Cognitive Science C100 recommended. This course will examine research investigating the neurological basis of cognition. Material covered will include the study of brain-injured patients, neuropsychological research in animals, and the study of normal cognitive processes in humans with non-invasive behavioral and physiological techniques. Course materials include readings taken from current neuroscience journals, with an emphasis on research that challenges previously held views on how the brain works. Also listed as Psychology C127.

C131. Computational Models of Cognition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Calculus, discrete mathematics, C1, Computer Science 61A, or equivalents. This course will provide advanced students in cognitive science, computer science and computer science with the skills to develop computational models of human cognition, giving insight into how people solve challenging computational problems and how this insight can be applied to solving computational problems closer to human performance. The course will explore three ways in which researchers have attempted to formalize cognitive—symbolic approaches, neural networks, and probabilistic and statistical models—considering the strengths and weaknesses of each. Also listed as Psychology C123.

C140. Quantitative Methods in Linguistics. (3) Three hours of lecture per week. Prerequisites: 100 or graduate student standing. The goals of this course are a deepened understanding of linguistic research using quantitative analysis, and an ability to use such analyses in original research. The course also serves as an introduction to the R programming environment for statistical analysis and data visualization. Also listed as Linguistics C160. (SP) Gahl

C142. Language and Thought. (3) Three hours of seminar per week. Prerequisites: C1 or equivalent. This seminar explores the relation of language and thought. Is language uniquely human, and if so, does this reveal about the human mind? Does the particular language you speak affect the way you think, or do human languages reflect a universal conceptual repertoire? The goal of this class is to familiarize you with a set of classic arguments on these themes, together with current research that evaluates these arguments, through weekly reading and discussion. Also listed as Linguistics C142. (SP) Regier

C147. Language Disorders. (3) Three hours of lecture/term paper per week. Prerequisites: Linguistics 100. An introduction to experimental and theoretical research on language disorders, particularly acquired aphasias in adults. Major course themes include the relationship between normal and pathological language, and the usefulness of linguistic analysis for empirical research. Topics include phonetic, phonological, morphological, semantic, syntactic, and pragmatic aspects of language disorders in both monolingual- and bilingual-speaking children and adult populations. Also listed as Linguistics C147. (F,SP) Gahl

190. Special Topics in Cognitive Science. (3) Course may be repeated for credit as topic varies. Two hours of seminar per week. Prerequisites: Consent of instructor. Selected topics in the study of cognitive science. (F,SP)

H195A-H195B. Special Study for Honors Candidates. (1-3;1-3) Course may be repeated for a maximum of 6 units. Individual conferences. Prerequisites: Open only to senior cognitive science majors in the honors program. Independent study and preparation of an honors thesis under the supervision of a faculty member. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Seminar for the group study of selected topics. Topics may be initiated by students subject to the approval of the major advisor. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Restricted to juniors and seniors. Independent study and research by arrangement with faculty. (F,SP) Staff

Graduate Courses

201. Graduate Seminar on the Mind and Language. (4) Four hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Thought and reasoning are grounded in the sensorimotor system, and to grow out of the nature of the physical brain and body; human reason also makes extensive and fundamental use of imaginative mechanisms such as metaphor and metonymy. The readings in this course review that evidence, much of which comes from the study of how people categorize and reason using categories. The course will include both discussions and research projects appropriate to students in each of the disciplines.

Professional Courses

300. Teaching Cognitive Science. (1-2) Course may be repeated for credit. Seminar format. Must be taken on a satisfactory/unsatisfactory basis. This course will provide training in a variety of teaching techniques, will review relevant pedagogical issues, and will assist undergraduate students in mastering their initial teaching experiences. (F,SP)
Lower Division Courses

1. Grammar and Vocabulary of Written English. (2) Two hours of lecture/workshop per week. Must be taken on a passed/not passed basis. Prerequisites: Self-selected, non-native speakers of English. This course is designed for a range of students, who are non-native speakers of English and who wish to work on their written English. The purpose of the course is to develop students’ ability to edit their own writing and improve their frequency of non-idiomatic uses of English. Intensive, individualized practice will be provided for students from different language backgrounds. (F,SP) Staff

R1A. Accelerated Reading and Composition. (6) Five hours of lecture/discussion and one hour of workshop per week. Prerequisite: Placement by UC Analytical Writing Placement Exam. Formerly 1A. An intensive, accelerated course satisfying concurrently the requirements of the UC Entry-Level Writing requirement and the first half of Reading and Composition requirement. Readings will include imaginative, expository and argumentative texts representative of the range of those encountered in the undergraduate curriculum and will feature authors from diverse social and cultural backgrounds and perspectives. Instruction in writing a range of discourse forms and in the revision of papers. (F,SP) Staff

R4A. Reading and Composition. (4) Three hours of seminar/discussion per week. Prerequisites: Self-selected, non-native speakers of English. This course is designed for a range of students, who are non-native speakers of English and who wish to work on their written English. The purpose of the course is to develop students’ ability to edit their own writing and improve their frequency of non-idiomatic uses of English. Intensive, individualized practice will be provided for students from different language backgrounds. (F,SP) Staff

R4B. Reading, Composition, and Research. (4) Three hours of seminar/discussion per week. Prerequisites: Satisfaction of the UC Entry-Level Writing requirement and the first half of the Reading and Composition requirement. The course is designed to offer students structured and highly articulated practice in the recursive processes entailed in reading, critical analysis, and composing. Students will read five thematically related book-length texts, or the equivalent, drawn from a range of genres, in addition to various non-print sources. In response to these materials, they will craft several short pieces leading up to three longer essays—works of exposition and argumentation. (F,SP) Staff

10A. Introduction to Public Speaking. (3) Three hours of lecture/discussion per week. This is a strictly introductory course. It presumes no formal training of any kind on the part of the students. Emphasis will be on organization and delivery with goals of improving content organization, speaking voice and enunciation. Part of the intent of the course is to introduce students to the rudiments of the rhetorical theory that lies behind the practice of public speaking. (F,SP) Staff

10B. Advanced Public Speaking. (3) Three hours of lecture per week. Prerequisites: 10A or equivalent. This is an advanced course that presumes introductory training in public speaking. Emphasis will be on real-world speaking situations. The course combines both theory and practice: it incorporates extensive speaking performance and individualized critiques from instructor and students, as well as analysis of advanced speaking models, and it explores theories, speech genres and rhetorical processes beyond those in the introductory course. The intent of the course is to advance students’ ability to deliver polished and informed public speeches adapted to a wide range of audiences and speaking situations. (F,SP) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Supervised seminar for group study of selected topics. (F,SP) Staff

Upper Division Courses

105. Intermediate Writing: Finding Your Voice with Others. (3) One and one-half hours of lecture and one and one-half hours of web-based lecture per week. Prerequisites: Fulfillment of both halves of Reading and Composition requirement. Engaging with issues of authorial voice, the writing process, and technology, students hone the ability to read and write academic prose. A hybrid composition course, this course meets in the classroom and online. Students learn Web 2.0 authoring tools and think critically about how such tools affect writing processes. Further, this course offers students opportunities to collaborate on projects, as is often required for academic and workplace writing, and which Web 2.0 writing tools are designed to support. (F,SP) Hammons

108. Advanced Composition: New Media. (3) Three hours of lecture per week. Prerequisites: Fulfillment of the Reading and Composition requirement up to and including 1B or consent of instructor. This advanced nonfiction writing course offers an opportunity to explore the definition of text in a digital era. It offers students an opportunity to read and write about how contemporary uses of social media influence how we think, act, interact, and learn. (F,SP) Staff

110. Advanced Composition: Challenging Writing. (4) Four hours of lecture per week. Prerequisites: Completion of Reading and Composition requirement (1A-1B) or consent of instructor. This writing workshop will offer students an opportunity to write essays and other nonfiction prose that speak both personally and politically to the issues and audiences they wish to address. The readings will focus on the rhetorical strategies of writers who have used the essay as a cultural form to challenge the norms of the time and place in which they live— (SP) Staff

121. Issues in Teaching English Internationally. (3) Three hours of lecture per week. Must be taken on a passed/not passed basis. This course offers students an opportunity to consider relevant academic and professional issues related to the teaching of English internationally. Through readings, discussions, and assigned projects, students learn about principles of language policy and planning, sociolinguistics, methodology, and assessment. These topics contribute to students’ understanding of the theoretical and practical aspects of effective English language teaching abroad, leading to responsibility in the international community of English language teachers and learners. (F,SP) Erickson

130. Introduction to the Craft of Creative Writing. (4) Three hours of lecture per week. Prerequisites: Completion of Reading and Composition requirement (1A-1B). This course in creative writing focuses on three genres: the personal essay, the short story, and the one-act play. The course emphasizes an introduction to craft—how these types of writing are generated, what their elements are, and how the finished pieces work—which students will explore through careful study of models by published writers and through writing and revising their own short pieces. (F,SP) Larkin, Levine, Oakes

151. Introduction to Principles of Professional Communication. (3) Three hours of lecture per week. Prerequisites: Reading and Composition requirement (1A-1B), junior or senior standing, Formerly C151 and Business Administration C198W. This course introduces students to key principles and rhetorical strategies of writing texts in non-academic settings. Although the course may address issues of oral communication, the primary focus will be on learning and practicing strategies to generate written documents in a business context. (F,SP) Cole

152. Advanced Professional Communication. (3) Three hours of lecture/discussion per week. Prerequisites: 151. In this course, students build upon introductory coursework in professional communication to develop and refine their proficiency in non-academic writing. Students, in teams of three to four, propose and generate authentic workplace documents for a local organization or business; the course culminates in formal presentations, discussions and activities regarding workplace genres, rhetorical techniques and strategies, and context-specific discourse conventions throughout term. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Supervised seminar for group study of selected topics. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of tutorial per week must be taken on a passed/not passed basis. Prerequisites: Consent of instructor, upper division standing. Independent study in topics not covered by regularly scheduled courses. Student must initiate topic and present a written proposal. (F,SP) Staff

Professional Courses

300. Introduction to Theories and Practices of Teaching College Composition. (2) Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as GSI or consent of instructor. The course will focus on teaching philosophies, course designs, instructional methods, and assessment issues in relation to teaching composition in a pluralistic setting. (F,SP) Staff
Students must have fulfilled the UC Berkeley Entry-Level Writing requirement before taking any course in the Department of Comparative Literature. For further information, see the College Writing Programs section of this catalog.

Program for Study Abroad. While progressing toward the undergraduate degree in comparative literature, you may have the opportunity to earn credit while studying abroad. Comparative literature majors are encouraged to participate in the Berkeley Programs for Study Abroad (EAP). For information about these programs, contact an adviser in the Berkeley Programs for Study Abroad Office, 160 Stephens Hall #2302, Berkeley, CA 94720-2302; (510) 642-1356; or studyabroad.berkeley.edu.

The Major

The emphasis of the undergraduate major is on a broad understanding of literary and cultural phenomena rather than on specialization, although some specialized courses are among the options open to students. Recent graduates have entered graduate programs in a variety of disciplines, including medicine, law, and the social sciences. Others have gone on to jobs in a wide spectrum of activities.

The junior course (CL 100) is designed to introduce students to a variety of literary texts and critical and theoretical approaches, and to encourage them to formulate their own standards and responses. The senior course (CL 190) is designed to help students apply the information and principles acquired in the junior course and undertake a study project involving literary traditions. The requirements for the A.B. with a major in comparative literature are listed below.

Lower Division Requirements. There are no lower division requirements beyond the completion of the Letters and Science Reading and Composition requirement and of adequate work in at least one foreign language sufficient to qualify for admission to upper-division literature courses in that language. Two semesters from the Comparative Literature 41 series (Introduction to Literary Forms) and two other literature courses are recommended but not required. Students who might be interested in the A.B. with honors should note the special requirements of that program (see below).

Upper Division Requirements. A minimum of 30 approved upper division units in literature, including: (1) a section of CL 100 in the junior year, a section of CL 190 in the senior year, and one comparative literature period course (the 151-155 series), chosen to fit the period of the student’s work in the “minor” literature (see below); (2) at least four courses in the “major” literature, totaling not fewer than 12 units, with readings in the original language and selected to fit the student’s period of primary interest (e.g. classical, medieval, early modern, modern); and (4) at least one upper division class in a classical literature, where works are read in translation or in the original from Greek, Latin, classical Arabic, Biblical Hebrew, Sanskrit, or classical Modern. Although only two literatures (for example, English-French) are required for the A.B. degree, adequately prepared students, especially those contemplating graduate studies, may find it advantageous to work in three.

Honors Requirements. Students who have attained junior standing may be admitted to the Honors Program if they: (1) have accumulated at least an overall 3.3 GPA and at least a 3.55 GPA in the major, and have accumulated at least a 3.65 GPA in the major and a 3.4 average in all work completed at the Uni-
The Graduate Program

Students are admitted for postbaccalaureate work leading to the Ph.D. degree. This degree prepares students for teaching and research in ancient and modern languages and literatures and is especially designed to encourage interdisciplinary research involving the study of literary and theoretical documents in several languages. The program is designed to provide students with the maximum flexibility compatible with a rigorous course of study. The program emphasizes comprehensive historical coverage of one literature, with students designing individual programs of study that reflect their interest in historical and national literatures. Further information concerning the program should be sought from the office of graduate studies in the Department of Comparative Literature.

Undergraduate Preparation.

Students interested in the Graduate Program in Comparative Literature at Berkeley are advised that strong undergraduate preparation in at least two foreign languages will speed up their work at the graduate level.

Requirements for the Ph.D. Degree. A minimum of 10 graduate courses is required for the Ph.D. degree, counted cumulatively from the beginning of graduate study. (Students who enter the program with M.A.s from other institutions will be able to count up to two M.A. courses toward the 10-course requirement.) Students must demonstrate competence in at least three languages other than English. Required courses include Approaches to Comparative Literature, as well as graduate-level courses in the major and each of two minor literatures. These are intended to help prepare students for the Ph.D. written and oral qualifying examination. Further information concerning the program should be sought from the office of graduate studies in the Department of Comparative Literature.

Lower Division Courses

H1A-H1B. English Composition in Connection with the Reading of World Literature. (4,4) Three hours of discussion/individual conference per week. Prerequisites: UC Analytical Writing Placement Exam; a 3.5 GPA in high school English; a reading knowledge of an ancient or modern foreign language; and permission of the instructor. Group study in sections. Required course work to involve analysis of selected masterpieces of ancient and modern literature. Limited to 10 qualified freshmen and/or sophomores who meet for round-table discussions and attend weekly tutorial sessions. Individual assignments provide each student with the opportunity to exploit his or her linguistic and literary training. H1A satisfies the first half of the Reading and Composition requirement, and H1B satisfies the second half.

R1A-R1B. English Composition in Connection with the Reading of World Literature. (4,4) Three hours of lecture per week plus individual conferences. Prerequisites: UC Entrance-Level Writing requirement or UC Analytical Writing Placement Exam. Students who have transferred and wish to apply the equivalent is required to 1B. Formerly 1A. Expository writing based on analysis of selected masterpieces of ancient and modern literature. R1A satisfies the first half of the Reading and Composition requirement, and R1B satisfies the second half.

R2B. English Composition in Connection with Reading of World and French Literature. (5) Five hours of lecture per week. Prerequisites: Three years of high school French or two years with a B+ average. Formerly 2B. Expository writing done in connection with the reading of selected masterpieces of ancient and modern literature and the study of selected French texts read in the original. Course will prepare students for more advanced work in French. R2A satisfies the first half of the Reading and Composition requirement, and R2B satisfies the second half.

R3B. English Composition in Connection with Reading of World and Hispanic Literature. (5) Five hours of lecture per week. Prerequisites: Three years of high school Spanish or two years with a B+ average. Formerly 3B. Expository writing done in connection with the reading of selected masterpieces of ancient and modern literature and the study of selected Spanish texts read in the original. Course will help prepare students for more advanced work in Spanish. R3A satisfies the first half of the Reading and Composition requirement.

20. Episodes in Literary Cultures. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Completion of Introduction to Comparative Literature is recommended but not required. An introductory level exploration of a specific author, theme or literary movement in an international context. Emphasis is placed on the ways in which literature has played (and continues to play) a crucial role in the relationship between different cultures, traditions, and languages. Readings and topics to vary from semester to semester. (F)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis: Sections 3-10 to be passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. Freshman seminars are offered in all campus departments and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen.

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. One hour of seminar per week per unit. Section 1 to be graded on a passed/not passed basis. Sections 2-10 to be graded on a letter-grade basis. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP)

40. Women and Literature. (4) Course may be repeated once for credit if topic varies. Three hours of lecture per week. A study of women as portrayed in literature, and of women writers. Selected readings on a topic which varies from semester to semester, with detailed consideration of both literary techniques and the problems of women.

41. Introduction to Literary Forms. Three hours of lecture per week. Comparative study of masterpieces of world literature.

200 / Comparative Literature

41A. Forms of the Epic. (4)

41B. Forms of the Lyric. (4)

41C. Forms of the Novel. (4, F, SP)

41D. Forms of the Drama. (4)

41E. Forms of the Cinema. (4, F, SP)

41F. Forms of Literary Theory. (4)

50. Creative Writing in Comparative Literature. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. A creative-writing workshop open to students who wish to study the theory and practice of writing as they work in a variety of forms and media. (F,SP)

60AC. Topics in the Literature of American Cultures. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Study of the literature of American culture. Topics will vary from semester to semester but may include such themes as cultures of the city; gender, race, ethnicity in U.S. literature; race and identity. Students should consult the department’s course bulletin well before the beginning of the semester for details. This course satisfies the American Cultures requirement. (F,SP)

98. Directed Group Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Lower division standing. Group study in a field that may not coincide with that of any regular course and must be specific enough to enable students to write essays based upon their studies.

Upper Division Courses

100. Introduction to Comparative Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: One upper division literature course in a foreign language or consent of the instructor. An introduction to problems of the comparative study of literature and culture, emphasis on principles of comparative methods and analysis with focus on selected literary, critical, and theoretical texts from antiquity to the present. Readings in English and at least one foreign language. (F,SP) Staff.

112A-112B. Modern Greek Language and Modern Greek Composition. (4,4) Three hours of lecture and one hour of discussion per week. Modern Greek pronunciation, vocabulary, grammar and syntax studied. The forms of writing (prose, poetry, drama) and the reading of literary texts as auxiliary to the acquisition of compositional skills. (F,SP)

113. Analyzing Greek Modernity. (4) Three hours of lecture per week. An investigation of some of the main dynamics that informed Greece’s idea of itself as a modern nation both in the Ottoman Empire and while still contending with the legacy of its Classical and Byzantine traditions. The course will bring to light and place into a context the relationship among the elements that have defined Greece’s identity and modernity: language, literature, and culture. Kotzamanidou.

120. The Biblical Tradition in Western Literature. (4) Three hours of lecture per week. Examination of selected aspects of the Biblical tradition and their relation to the study of later literature.

151. The Ancient Mediterranean World. (3) Three hours of lecture per week. Prerequisites: Upper division standing or consent of instructor. Graduate students who wish to take this course are required to go back to the original Hebrew, Greek, or Latin texts. The literature of Greece, Rome, the Biblical lands, and other ancient civilizations of the Mediterranean basin.

152. The Middle Ages. (4) Three hours of lecture per week. Prerequisites: Upper division standing or consent of instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. The literature of the Middle Ages.

153. The Renaissance. (3) Three hours of lecture per week. Prerequisites: Upper division standing or permission of the instructor. Graduate students wish-
ing to enroll must know at least one foreign language relevant to the materials studied. European literature of the Renaissance.

154. Eighteenth- and 19th-Century Literature. (4) Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Graduate students wishing to enroll must know at least one foreign language relevant to the materials studied. Literature of the 18th and 19th centuries.

155. The Modern Period. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Upper division standing or permission of the instructor. Graduate student wishing to enroll must know at least one foreign language relevant to the materials studied. Literature of the 19th and 20th centuries. (F.S.P)

156. Fiction and Culture of the Americas. (4) Three hours of lecture per week. Comparative study of American, Native-American, Spanish-American, Caribbean, and Brazilian literature and culture. Readings chosen to illustrate diverse attitudes of Americans toward their culture, politics, and environment.


170. Special Topics in Comparative Literature. (1-4) Course may be repeated for credit with consent of instructor. One to four hours of lecture/discussion per week. An independent studies course designed to fulfill a need intrinsic to the undergraduate major’s program which cannot otherwise be satisfied because it involves either a literature not covered in regularly scheduled course offerings or a special methodological, and/or post-colonial approach.

171. Topics in Modern Greek Literature. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: Completion of a Modern Greek 112B or consent of instructor. This course frames methodologically selected topics in modern Greek literature and places them in their historical, social, or cultural context. (F.S.P)

190. Senior Seminar in Comparative Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion or three hours of seminar per week. An independent studies course designed to fulfill a need intrinsic to the undergraduate major’s program which cannot otherwise be satisfied because it involves either a literature not covered in regularly scheduled course offerings or a special methodological, and/or post-colonial approach.

H195. Honors Course. (1-4) Course may be repeated for credit. Hours to be arranged. Prerequisites: Honors standing. 8 units in upper-division literature courses, including 100 or the equivalent, and knowledge of a vernacular language or a classical language. Preparation and writing of an honors thesis under the supervision of a member of the faculty. (F.S.P)

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing or consent of instructor. Must be taken on a passed/not passed basis. Enrollment restrictions apply.

Graduate Courses

The following graduate courses numbered 200 through 260 require at least 16 hours per week of effort, including time spent in class and in outside reading and preparation.

200. Approaches to Comparative Literature. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Admission to graduate standing in comparative literature.

Lectures on literary theory, on the study of criticism, and on the methods of comparative literary theory.

201. Proseminar. (1) One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Required for all first-year graduate students. This course is designed to give all new graduate students a broad view of the department's faculty, the courses they teach, and their fields of research. In addition, it will introduce students to some practical aspects of graduate career, issues that pertain to specific fields of research, and questions currently being debated across the profession. The readings for the course will be selected by the instructor and will consist of copies of materials by the department's faculty. Consent of the instructor. (F.S.P)

202. Approaches to Genre. Three hours of lecture/discussion per week. Prerequisites: Admission to graduate standing in comparative literature: advanced undergraduates may be admitted with the consent of the instructor. Application of the methods of comparative literature to the study of genres.

202A. Epic and Saga. (4)

202B. Lyric Poetry. (4)

202C. The Novel. (4)

210. Studies in Ancient Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in ancient Greek or Latin and familiarity with at least one modern foreign language. Comparative investigation of a topic in ancient literature between the eighth century B.C.E. and the fourth century C.E. with some attention to the development of literary criticism.

212. Studies in Medieval Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two medieval languages. Comparative investigation of a topic in literature and culture between the fifth and the 14th centuries.

215. Studies in Renaissance Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in Western literature in the Renaissance period.

C221. Aesthetics as Critique. (4) Three hours of lecture per week. Formerly 221A. A close reading and discussion of the major texts of modern aesthetics, from the 18th century to the present, with emphasis on the Continental tradition of Kant, Adorno, and Derrida. Also listed as Rhetoric C221.

223. Studies in the 19th Century. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of major themes in 19th century literature and culture.

225. Studies in Symbolist and Modern Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in literature and culture of the modern period.

227. Studies in Contemporary Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in contemporary literature and culture.

232. Studies in Near Eastern-Western Literary Relations. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in a Near Eastern or a European language. Undergraduates may be admitted with the consent of the instructor. Comparative investigation of a literary topic requiring the study of both Near Eastern and Western documents.

240. Studies in the Relations Between Literature and the Other Arts. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in the theory of literature.

245. Studies in Other Literary Traditions. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of topics in the theory and practice of translation. Students will complete a project in literary translation.

252. Gender, Sexuality, and Culture. (4) Three hours of lecture/discussion per week. Comparative investigation of a topic related to the study of gender and/or sexuality in literature and culture.

254. Studies in West-East Literary Relations. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages, one of which must be an East Asian language. Formerly C254. Comparative investigation of a literary topic requiring the study of both East Asian and Westem documents.

256. The Craft of Creative Writing. (4) Three hours of lecture/discussion per week. The course will proceed through exercises and critical essays, with class discussion of the work that will be done by members of the seminar. Some analytic attention will also be devoted to existing models of critical writing. Some prerequisites: Undergraduate admission details that make for lucidity and felicity of style and will also consider larger issues of organization, critical focus, and audience.

258. Studies in Philosophy and Literature. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in the relationship between philosophy and literature.

260. Problems in Literary Translation. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages or permission of the instructor. Theory and practice of translation. Students will complete a project in literary translation.

265. Gender, Sexuality, and Culture. (4) Three hours of lecture/discussion per week. Comparative investigation of a topic related to the study of gender and/or sexuality in literature and culture.

266. Nationalism, Colonialism, and Culture. (4) Three hours of lecture/discussion per week. Prerequisites: Preparation in two foreign languages. Comparative investigation of a topic in ideology, politics, and identity and its relation to the formation of national, colonial, and/or post-colonial cultures.

270. Continuing Seminars. Two hours of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to students who have completed the M.A. and are studying for their qualifying examination in comparative literature. Discussion on problems of the literature of the period.

298. Special Study. (1-4) Course may be repeated for credit. Hours to be arranged. Prerequisites: Graduate standing. Primarily for students engaged in preliminary exploration of a restricted field, involving the writing of a report. May not be substituted for available seminars. (F.S.P)

299. Directed Research. (1-12) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Satisfactory completion of the qualifying examination. Writing of the doctoral dissertation. (F.S.P)

601. Individual Study for Master’s Students. (1-8) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study for the comprehensive or language requirement in consultation with the graduate adviser. Units may not be used to meet either unit or residence requirements for the master’s degree. (F.S.P)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Satisfactory completion of the master’s examination. Individual study in consultation with the graduate adviser intended to provide additional preparation for candidates with supervising interests. May be used for credit. May be used for unit or residence requirements for the doctoral degree. (F.S.P)

Professional Courses

300. Supervised Teaching in Comparative Literature. (1-4) Course may be repeated for credit. Regu- larly to be arranged with supervising instructor. May be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor in the department. Consent of graduate
adviser. Course credit for experience gained in academic teaching through employment as a graduate student instructor. (F,SP)

360S. Methods of Teaching Literature and English Composition-Comparative Literature. (2) Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor or consent of instructor. Formerly 360A-360B. Discussion of the theory and practice of teaching composition at the college level in a department of comparative literature. (F)

Computer Science (Letters & Science) (College of Letters and Science)
Computer Science Division Office: 387 Soda Hall eecs.berkeley.edu

Faculty and Courses
Computer science faculty and courses are listed under the Electrical Engineering and Computer Sciences section in this catalog.

Choice of College
There are two ways to study computer science at Berkeley. The first is to be admitted to the EECS major in the College of Engineering (COE) as a freshman. Admission to the COE, however, is extremely competitive. The other way is to enter the College of Letters and Science and, after two years and successful completion of required courses, be admitted to the L&S computer science major. The EECS path is appropriate for people who want an engineering education. The L&S path is appropriate for people who are interested in a broader education in the sciences and arts, and/or are not sure at the time of application that they can gain admission to EECS.

Details about the computer science and engineering program in the Department of Electrical Engineering and Computer Sciences may be found in the Electrical Engineering and Computer Sciences section of this catalog or at eecs.berkeley.edu.

Computer Science Major in the College of Letters and Science
Berkeley emphasizes the science of computer science, which means much more than just computer programming. It includes the theory of computation, the design and analysis of algorithms, the architecture and logic design of computers, programming languages, compilers, operating systems, scientific computation, computer graphics, data bases, artificial intelligence, and natural language processing. Our goal is to prepare students both for a possible research career and long-term technical leadership in industry. We must therefore look beyond the basics of computer science and give students the primary ideas and the learning skills that will prepare them to think for themselves about tomorrow’s technology.

It is necessary to achieve an overall and technical GPA of 2.0 to declare the computer science major. The technical GPA (that is, the GPA in the lower division courses required for the major) is the main determining factor, and students meeting the criteria are routinely approved. Applications to the major should be submitted to the Computer Science Advising Office, 377 Soda Hall, (510) 642-7214, during the semester in which the final technical prerequisites are being completed.

Transfer students admitted to Berkeley must, in addition, apply separately to the computer science major. Not all transfer students will meet the criteria required for the major. Therefore, we recommend that transfer students be prepared to pursue an alternative major at Berkeley. For further information, contact the Advising Office.

Requirements for the Major
Lower Division. The following lower division courses are required for admission to the major:

(1) College-level calculus and linear algebra/differential equations (Math 1A-1B, 54).
(2) Discrete Mathematics and Probability Theory (CS 70).
(3) Electronics (EE 42 or 40). It is strongly recommended that EE 42, a 1-unit laboratory course, be taken concurrently with EE 42.
(4) Computer science (CS 61A-61B-61C). All the above courses must be graded; none may be passed/not passed with the exception of EE 43.

Upper Division. A total of 27 units of upper division courses including:

(1) Required courses: CS 162, 170;
(2) Breadth courses, choose two from the following: CS 150, 152, 160, 161, 164, 189, 184, 186, 188;
(3) Any two additional computer science courses;
(4) Technical electives: Any course from the approved list of non-CS technical electives found at eecs.berkeley.edu/csugrad/tech_electives.

Note: For updates and/or current information, visit eecs.berkeley.edu/csugrad.

Minimum Scholarship. All courses taken in satisfaction of the major requirements must be graded; none may be taken passed/not passed. A GPA of 2.0 in the upper division courses is required for graduation. The division monitors the progress of majors and expects them to maintain a 2.0 GPA from semester to semester.

Honors Program. Computer science majors with an overall GPA of 3.75 or above are eligible to apply to the EECS Honors Program. Information is available at eecs.berkeley.edu/programs/honors.html.

Minor in Computer Science
A minor in computer science is available to all undergraduate students at Berkeley with a declared major, with the exception of CS majors in EECS. Requirements for the minor are: CS 61A, 61B or 61BL, 61C or 61CL, 70 or M55, plus any three upper division courses in EECS. Students submit applications to the minor program after completing the majority of the lower division requirements with a technical GPA of at least 2.0. A notation is made on the final transcript. For more information, visit eecs.berkeley.edu/csugrad/minor.

Advanced Degree Program
The Five-Year Bachelor/Master’s Program in EECS (B.A./M.S or B.S./M.S.). The combined Bachelor’s/Master’s Program is designed to take outstanding EECS and CS L&S undergraduates immediately into an intensive two-semester program conferring the Master of Science degree.

This combined program promotes interdisciplinary focus and is best suited for those who are more “professionally oriented,” as opposed to those wishing to pursue a more traditional research-based and discipline-specialized advanced course of study. As such, a distinguishing feature of this five-year program is its emphasis upon extended study in interdisciplinary, though allied, technical fields such as physics, biology, and statistics, or in professional disciplines such as business, law, or public policy. The program is aptly entitled, educating Leaders for the Emerging Global Economy, and reflects a growing need for those who are technically skilled and also possess an understanding of the business, legal, and social context of technology development and use.

Conerral of the degree requires either writing a thesis (Plan I) or reporting on a project (Plan II), as is required of our other master’s students.

Complete information is available at eecs.berkeley.edu/FiveYearMS.

Graduate Program
Graduate degree programs are available as preparation for research and teaching (Master of Science and Doctor of Philosophy in Computer Science or Engineering) and for careers in design, development, and management (Master of Engineering and Doctor of Engineering). For details on graduate programs and procedures, see the Computer Science and Computer Sciences section of this catalog.

Critical Theory
(College of Letters and Science)

Group Major Office: 4327 Dwainelle Hall, (510) 642-1328 towsendlab.berkeley.edu/critical-theory
Co-Directors: Judith Butler and Martin Jay
Graduate Group Professors (Core Faculty)
Wendy Brown (Political Science)
Judith Butler (Rhetoric/Comparative Literature)
Anita Caccardi (Rhetoric/Comparative Literature/Spanish and Portuguese)
Pheng Cheah (Rhetoric)
Martin Jay (History)
Donna J. Jabeen (English)
Robert Kaufman (Comparative Literature)
Niklas Luhman (German)
John Loe (Sociology/International and Area Studies)
Saba Mahmood (Anthropology)
Nelson Maldonado-Novaes (Ethnic Studies)
Jose David Salidrivar (English/Ethnic Studies)
Hans Sluga (Philo)
T. J. Clark (History of Art Emeritus)

Affiliated Graduate Group Faculty
Charles Altieri (English)
Stephen Best (English)
Dan Benton (English)
Michael Buresowy (Sociology)
Lawrence Cohen (Anthropology)
Whitney Davis (History of Art)
Samer Esmeei (Rhetoric)
Karen Feldinan (German/Rhetoric)
Keith Feidman (Ethnic Studies)
Marcia Gonzalez (English)
Suzanne Guercin (French)
Josef Podhajsky (Music)
Gillian Hart (Geography)
Charles Hirschkind (Anthropology)
Shannon Jackson (Performance Studies/Rhetoric)
Abdul JanMohamed (English)
Tony Kao (Film Studies/German)
Celeste Langan (English)
Zuzana Liptak (Literature)
Colleen Lye (English)
Heena Naadadfi (Rhetoric)
Maura Nolan (English)
Alhwa Ory (Anthropology)
Stefana Pandolfo (Anthropology)
Paul Reubolz (Anthropology)
Dylan Riley (Sociology)
Debarati Saray (French)
Ji Won (East Asian Languages and Cultures)
Barbara Spackman (Italian/Comparative Literature/Gender and Women’s Studies)
Sara T functioning (French Emerita)
Aihwa Ong (Anthropology)
Charles Altieri (English)
Martin Jay (History)

Overview
The Designated Emphasis in Critical Theory permits interested students to specialize in critical theory and obtain certification of this specialization while pursuing a Ph.D in an established UC Berkeley department. Critical theory is an independent degree-granting program. Students admitted to the DE and completing the requirements will receive a parenthetical notation to that effect on their doctoral degrees.

Critical theory is typically associated with the work of the Frankfurt School, and that tradition of theory
and the problem of political dissent and citizenship, may include post-continental political theory, critique and exploration of various contemporary engagements with the critical theory designated emphasis or consent of instructor. This course will examine various formulations of critique in 19th-century thought. Thinkers who may be studied include Kant, Hegel, Marx, Nietzsche, and Weber, though the selection will vary by instructor. This is the “foundations” course for the Designated Emphasis in Critical Theory. (F) Brown

205. The Classical Frankfurt School: The First Generation of Critical Theory. (4) Three hours of lecture per week. Prerequisites: Admission to the critical theory designated emphasis or consent of instructor. This course will explore the founding texts of the Frankfurt School’s first generation: Horkheimer, Adorno, Benjamin, Marcuse, Lowenthal, and their circle. It will follow the development of critical theory through its Weimar years, American exile, and return to postwar Germany. (F) Jay

240. Contemporary Critique and Critical Theory. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Admission to the critical theory designated emphasis or consent of instructor. This course will explore various contemporary engagements with the foundational ideas and locations. Topics will vary by instructor but may include post-continental political theory, critique and the problem of political dissent and citizenship, gender and race in relation to critical practices, psychoanalysis, and literary and art theory and criticism. (F,SP) Staff

Demography

Demography

Department (College of Letters and Science)

Department Office: 2232 Piedmont Avenue, (510) 642-9800, demog.berkeley.edu

Chair: Michael Hout, Ph.D.

Professors

Michael Hout (Chair), Ph.D. Social demography, especially the role of demography in social change (Sociology/Demography)

Ronald Lee, Ph.D. Economic, mathematical, and historical demographic theory (Economics)

Kenneth Wachter, Ph.D. Mathematical demography, biodemography, kinship, aging, censuses, simulation (Demography/Statistics)

Eugene A. Hammel (Emeritus), Ph.D. Historical and anthropological demography, simulation modeling (Anthropology/Demography)

Associate Professors

Jennifer Johnson-Hanks, Ph.D. Fertility, nuptiality, education, social organization, qualitative methods, Africa (Demography-Sociology)

John Udry, Ph.D. Mortality and health, demographic estimation, social demography (Demography)

Affiliated Faculty

Irene Bloemraad, Ph.D. (Sociology)

David Card, Ph.D. (Economics)

Ralph Catalano, Ph.D. (Public Health)

Jan de Vries, Ph.D. (Economics)

Stefano DellaVigna, Ph.D. (Economics)

Will Dow, Ph.D. (Public Health)

Diana Greene Foster, Ph.D. (Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco)

Paul Gertler, Ph.D. (Business Administration/Public Health)

Leo Goodman, Ph.D. (Psychology)

Rucker Johnson, Ph.D. (Public Policy)

David Levine, Ph.D. (Haas School of Business)

Ethan Ligom, Ph.D. (Agricultural and Resource Economics)

Samuel Lucas, Ph.D. (Sociology)

Kristin Luker, Ph.D. (Sociology)

Jane Mauldon, Ph.D. (Public Policy)

Daniel McFadden, Ph.D. (Economics)

Enrico Moretti, Ph.D. (Economics)

Malcolm Potts, Ph.D. (Health Affairs)

Steven Raphael, Ph.D. (Public Policy)

Michael Tarter, Ph.D. (Public Health)

Graduate Adviser: John Wilmoth

Graduate Assistant: Monique Verrier

Department Overview

The Department of Demography offers an inter-disciplinary training program leading to the M.A. and Ph.D. in demography. Demography is the systematic study of human populations, a topic central to many pressing policy issues such as the economic development of Third World countries, population aging, the environment, health and mortality, family and household change, immigration, and fertility. Demography also has strong intellectual and institutional ties to other fields such as sociology, economics, social history, anthropology, biology, public health, and statistics. The program at Berkeley is one of the few in the United States granting graduate degrees in demography, rather than offering demography only as a field of specialization within some other department. This training strategy permits greater concentration and depth in demography, as well as program flexibility and breadth in related subjects. The program stresses both quantitative aspects of demography and demography in the context of social science theory.

No Undergraduate Major

Although there is no undergraduate major, seniors may take graduate courses with consent of the instructor. The department offers an undergraduate minor in demography that is open to all interested undergraduates at Berkeley. (See Minor in Demography, at right.)

Graduate Programs

The master’s degree in demography is designed both as a final degree for those who wish to pursue a professional career at that level of training, and as a second degree for students earning a doctorate in demography or a related discipline. The basic coursework for the master’s program is required for the doctoral program. Students already enrolled at a UC campus or at Stanford University are admissible to demography courses if they have completed the prerequisites. Students already enrolled in another graduate program at Berkeley who wish to earn a degree in demography may apply by executing a change or addition of major.

Students not already enrolled at Berkeley who wish to enter the degree programs or pursue coursework only for professional upgrading should complete the required application and submit it to the student affairs officer in the department’s main office. The general deadlines for application specified by the Graduate Division apply, as do the specific degree requirements, consult the department website or contact the graduate assistant or graduate adviser.

Doctoral students in demography are required to have or to earn a master’s degree in an allied discipline.

Graduate Group in Sociology and Demography (Ph.D. Program)

See the Sociology and Demography section in this catalog or visit demog.berkeley.edu/students/socdemog.shtml.

Minor in Demography

UC students may complete one or more minor programs, normally in a field both academically and administratively distinct from their major.

Requirements. The undergraduate minor in demography provides an opportunity to combine a traditional major, typically in one of the social sciences, with specialized training in demography. Students in the minor must complete, with a GPA of at least 2.0 (C), a total of five upper division courses. All courses applied to the minor must be taken for a letter grade. The courses are chosen as follows:

Three required courses: Demography 110, 126, and 175. Substitutions are not allowed.

One elective course from Public Health 140 or 142A; Economics 140 or 141; Sociology 105; Statistics 102, 131A, or 135. These courses are in statistical methods or vital statistics. Similar courses of at least 3 units may be substituted with consent of the department.

One elective course from Demography 140, 145, 164, 165, 189; Economics 155, 157, or 171; History 137; Sociology 111, 125. These courses are in social science dealing with demographic factors. Similar courses of at least 3 units may be substituted with consent of the department.

At least three of the five required courses must be completed at Berkeley. Note: According to University policy, no more than one course can be counted for both a student’s major and minor degrees.

For up-to-date information about course requirements, visit demog.berkeley.edu/degrees/undergraduate.shtml.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a pass/not passed basis. The Freshman Seminar Program has
C175. Economic Demography. (3) Three hours of lecture per week. Prerequisites: Economics 1 or 2. Formerly 175. A general introduction to economic theories of demography. Among the topics are fertility and family planning, income, and the demographic impact of questions: What are the economic consequences of immigration to the U.S.? Will industrial nations be able to afford the health and pension costs of the aging population? Has technology changed its economic well being? Why has fertility been high in Third World countries? In industrial countries, why is marriage postponed, divorce high, fertility so low, and extramarital fertility increasing? What are the economic and environmental consequences of rapid population growth? Also listed as Economics C175. (SP) Lee

198. Directed Group Study. (1-4) Course may be repeated for credit. One to three hours of tutorial per week. Must be taken on a pass/no pass basis. Prerequisites: 210, Population Studies 110, or consent of instructor. Undergraduate research by small groups. Enrollment is restricted by regulations governing 198 classes. (F,SP) Staff

Graduate Courses

210. Demographic Methods: Rates and Structures. (3) Three hours of lecture per week. Prerequisites: 210, Population Studies 110, or consent of instructor. This course is designed to provide an overview of quantitative techniques commonly used in demography, sociology, economics, and other social sciences. Methods are described in both words and formulas, and students are encouraged to learn to move freely between verbal and mathematical representations of data. (SP) Wilmuth

212. Advanced Demographic Methods. (3) Three hours of seminar per week. Prerequisites: 210, Population Studies 110, or consent of instructor. This course is designed to provide an overview of quantitative techniques commonly used in demography, sociology, economics, and other social sciences. Methods are described in both words and formulas, and students are encouraged to learn to move freely between verbal and mathematical representations of data. (SP) Wilmuth

213. Practical Computer Applications for Demographic Analysis. (2) Three hours of lecture/laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. An introductory course for first-year Ph.D. students. Introduction to the use of the Demography Laboratory. Covers Unix-based tools for manipulating computer programs and data files, and the R, SPlus, and SAS statistical packages. The course introduces the population projection model and methods of estimating it. The final project for this course is use of the 1995 Current Population Survey (fertility supplement) to compute total fertility rates for the United States. (F) Mason

215. Current Research Topics in Demography. (2) One hour of lecture and two hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 213. The goals of this course are: (1) to familiarize graduate students with active research being conducted in the area of demographic analysis and improve skills in R and Stata. Topics include demographic micro-simulation with SOCSIM, the Human Mortality Database, stochastic simulation/forecasting, GIS for demographers, and mortality forecasting. Two-thirds of class time will be spent in the computer laboratory. Students will present results. (SP) Staff

220. Human Fertility. (4) Three hours of lecture per week. This course offers a critical, graduate-level introduction to the social science of reproduction, demographic and household theories from demography, sociology, and anthropology. Among the topics are parity specific control and the calculus of conscious choice, below-replacement fertility, and the political economy of stratified reproduction. (F,SP) Johnson-Hanks

230. Human Mortality. (4) Three hours of lecture per week. Prerequisites: 210 or consent of instructor. Measurement of mortality by age and cause. Traditional, transitional, and modern mortality patterns in European and non-European areas. Current trends and differentials by age, sex, race, occupation, and marital status. Analysis of the demographic and economic aspects of mortality decline and fertility change and development. (F,SP) Wilmuth

C236. Aging: Economic and Demographic Aspects. (2) Two hours of lecture per week for seven and one-half weeks. Course considers demographic and economic aspects of population aging. Also listed as Economics C2275S. (SP) Lee

240. Human Migration. (2) Three hours of lecture for seven and one-half weeks. Human populations analyzed from the stand point of their spatial distribution and movement. Special attention to rural-urban migration, metropolitan structure, inter-regional movement, and demographic consequences. Collection and analysis of emigration and immigration data and statistics, migration policies. (F,SP) Staff

250. Mathematical Demography. (2-3) Three hours of lecture per week. Prerequisites: Consent of instructor. Special topics in demography, such as anthropological and evolutionary approaches, kinship and family structure, and demography of social change. Course may be repeated in such a way as to allow Berkeley students to receive full 4-unit credit for a 15-week course. UCLA students will receive credit for a 10-week, self-contained part of the course (2-3 units). (F,SP) Staff

260. Special Topics in Demography Seminar. (1-4) Four hours of lecture per week. Prerequisites: 210, Population Studies 110, or consent of instructor. Course may be repeated for credit. One to four hours of seminar per week. One and one-half to six hours of seminar for 10 weeks. Two to seven hours of seminar every other week. Two and one-half to nine and one-half hours of seminar for six weeks. Prerequisites: Consent of instructor. Special topics in demography, such as anthropological and evolutionary approaches, kinship and family structure, and demographic consequences. Course may be repeated for credit as topic varies. (SP) Wachter

C275A. Economic Demography. (3) Two hours of lecture per week. Economic consequences of demographic change in developing and developed countries including capital formation, labor markets, and intergenerational transfers. Economic determinants of fertility, mortality and migration. Also listed as Economics C275B. (F,SP) Staff

296. Advanced Research Techniques. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 295 and consent of instructor. Problems in data acquisition, analysis, and presentation of technical demographic research. Required of all graduate students in the Ph.D. program in demography. (F,SP) Staff

298. Directed Reading. (1-12) Course may be repeated for credit. Prerequisites: Consent of instructor. Intended to provide directed reading in subject matter not covered in available course offerings. (F,SP) Staff

299. Directed Research. (1-12) Course may be repeated for credit. Prerequisites: Consent of instructor. Intended to provide supervision in the preparation of an original research paper or dissertation. (F,SP) Staff

601. Individual Study. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study, in consultation with the graduate advisor, intended for qualified students to do necessary work to prepare themselves for language examinations and the comprehensive examination. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For qualified graduate students. Individual study in consultation with the major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff
organized as an interdisciplinary group major participating in the program follow a plan of study published under the auspices of the Institute of International and Area Studies, and teaching associates working in related fields. To paraphrase Nobel Laureate Amartya Sen, major and minor requirements are at the heart of the development of human capabilities and the maximization of human choices—what he calls "development as freedom." The development studies major focuses on the role of history, markets, states, and civil society in the eradication of mass poverty and the improvement of human well-being in the Global South. The Department of Development Studies major requirements are not automatically accepted by the DS major. Please see an adviser for information on current acceptance guidelines established by the College of Letters and Science.

The Program

The problems of development are urgent, massive, and enormously complex, and they transcend the boundaries of conventional academic disciplines. To paraphrase Nobel Laureate Amartya Sen, they "call for the enhancement of human capabilities and the maximization of human choices—what he calls "development as freedom." The development studies major focuses on the role of history, markets, states, and civil society in the eradication of mass poverty and the improvement of human well-being in the Global South.

While development studies focuses on the global aspect of current development problems, students will also be rooted in local and regional aspects of development trends. Thus, studying development as a social, economic, and political transformation requires a blending of knowledge and perspectives from political science, economics, sociology, psychology, anthropology, geography, history, and resource and environmental science.

Development studies majors are required to take core courses in development theory and build upon this core with coursework focusing on: (1) a discipline-centered major area of study; (2) one or more courses outside the College of Letters and Science may be used to fulfill major requirements.

Courses Outside the College of Letters and Science. More than three courses outside the College of Letters and Science may be used to fulfill major requirements. Study Abroad. The use of coursework taken at institutions outside the United States to fulfill major requirements is restricted to the equivalent of three semester-long upper division courses. Courses taken to fulfill the foreign language requirement for the major group are not included in this restriction. Transfer Courses. A maximum of three upper division courses taken at other institutions (including those of the UC Education Abroad Program) may be transferred into the major. These courses will be accepted only as three of the nine required upper division courses (regardless of unit value) and must be approved by the Office of Undergraduate Admissions and approved by an IAS adviser. Courses used to fulfill foreign language and lower division requirements are not included in this restriction but must be approved by an adviser.

Honors Program. To graduate with honors from the major group in development studies, students must enroll in the two-semester honors seminar, IAS H102 (fall only) and DS H195 (spring only), and must obtain GPA of 3.6 in the major and 3.5 in overall University of California units. The honors seminar (DS H195) is taken in addition to a student’s regular coursework for fulfilling requirements for the major and culminates in the writing of a senior thesis. To qualify for DS H195, students must be recommended by the IAS H102 instructor. The DS H195 instructor and at least one other faculty member, selected by the student, in consultation with the thesis advisor, read the thesis. Eligibility for participation in the Honors Program is determined in the IAS office.

Note: There is no guarantee that students accepted into the Honors Program will graduate with honors. Honors recommendations are made after graduation in consultation with honors committee, including (but not limited to) major GPA, grades received for IAS H102 and DS H195, and faculty adviser recommendations. Course Plan. There is considerable flexibility within DS for students to construct programs appropriate to their specific intellectual and geographic interests. There is, however, a structure built into the major and minimal core course requirements that must be met. The structure is designed to provide all DS students with a common knowledge base and intellectual reference points.

The Group Major

Declaring a major in development studies follows guidelines established by the College of Letters and Science. Students wishing to declare a major in development studies: (1) completed DS 10 (fall semester only) with a grade of C or better; (2) completed Econ 1, 2, or 3 at Berkeley with a grade of C or better, or the equivalent; (3) must have passed AP scores of 4 or 5 on both microeconomics and macroeconomics exams; (4) must have attended a major declaration workshop; (2) are encouraged to have completed at least two semesters of college-level language courses; the equivalent; and (5) must not be in their final semester of undergraduate work. Students are reminded that: (1) no coursework for the major may be taken on a passed/not passed basis, and (2) no course may be used to satisfy requirements in both a major and a minor.

Minor. Development studies does not offer a minor program. However, other minor programs taken in conjunction with development studies are encouraged. No more than one upper division course can be used to satisfy requirements in both a major and a minor.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science, and no more than two upper division courses may be used to satisfy requirements in both majors.

The development studies major is a critical course since it provides the essential theoretical, and methodological grounding in development studies. There is also a language proficiency requirement which, depending on one’s language skills, could require language courses.

The upper division courses include: DS 100, History of Development and Underdevelopment; five additional courses are arranged to meet disciplinary, development, and methodological requirements; and three area courses. The area courses must focus on a geographic region (Latin America, South Asia, Africa, etc.) and provide a working knowledge of the culture, history, and political economy of a region in the developing world.

Foreign Language Requirement. All DS students must be able to demonstrate proficiency in any single modern language (other than English) by the last semester of their senior year. Proficiency is equivalent to four college-level semesters (or two years). Note: Languages accepted by the College of Letters and Science are not automatically accepted by the DS major. Please see an adviser about eligible languages.

There are three ways students can fulfill the four-semester language requirement, depending on their backgrounds and abilities:

(1) Through coursework. Any combination of college courses, summer programs, or college-level language-based programs may be used to fulfill the foreign language requirement. At a minimum, students must complete the fourth semester of a language with a grade of C- or better. The first, second, or third semester language may be passed/not passed on a pass/fail basis; the fourth semester must be taken for a letter grade. Language courses need not be taken at Berkeley; courses taken at a community college or any accredited school or university are acceptable. Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided to an IAS adviser concerning language study abroad.

(2) With a proficiency exam. Students whose language skills are at fourth semester or beyond and who do not wish to take courses can opt to test out of this requirement. However, not all of Berkeley’s language department language proficiency exams are acceptable. Students must pass a proficiency test (if offered by the language department) or provide documentation (usually a transcript) that they have been educated in their native language at least through high school or any accredited school or university are acceptable. Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided to an IAS adviser concerning language study abroad.

(3) Being a non-native English speaker. Non-native speakers of English who wish to satisfy this requirement with their native language must supply documentation of foreign language ability. They may choose to take a proficiency test (if offered by the language department) or provide documentation (usually a transcript) that they have been educated in their native language at least through high school or any accredited school or university are acceptable. Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided to an IAS adviser concerning language study abroad.

Lower Division Requirements. There are five required courses at the lower division level. DS 10 is a critical course since it provides the essential background for DS 100. Lower division requirements may be satisfied as follows: four upper division classes with prior consent from a faculty adviser. Several options are listed below. Consult the IAS office for information on current acceptable substitutions.

Required Courses. Anthropology 3, Development Studies 10: Economics 1 or 2, International and Area Studies 45; Statistics 2, 20, or 21. DS 10 and
Econ 1 or 2 must be completed before admission to the major with grades of C or better.

Upper Division Requirements. No less than nine upper division courses, including five core courses, one course in research methods, and three upper-division courses are required. Specifically, the requirements are as follows:

Core courses. Minimum of five courses. Development Studies 100 is required. The four additional core courses are meant to provide a systematic background for students in two critical domains: (1) a discipline of second language and (2) development theory. Each DS major should endeavor to build up a strong command of one social science discipline (for example, economics, political science, geography) in which to understand the interrelationships of development and underdevelopment. Also listed as Geography C112. (SP) Hart

150. Advanced Studies in Development Studies. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. May be repeated for credit. Department research in current issues and topics of development. Seminars will focus on specific geographical areas with appropriate comparative material included. A major research project is required as well as class presentations. Topics change each semester. (F,SP) Hart

192. Senior Thesis. (3) Individual weekly meetings. Prerequisites: Upper division standing and consent of instructor. The course is designed to provide a vehicle for undergraduate students interested in writing a major paper on a development topic. The paper should be approximately 30 pages in length. The student and faculty sponsor should agree upon the topic in advance. (F,SP)

H195. Senior Honors Thesis Seminar. (4) Two hours of seminar plus one hour of consultation per week. Prerequisites: International and Area Studies 102 and consent of instructor; senior standing. Honors students are required to research and write a thesis based on research conducted on the Internship and Area Studies 102. The thesis work is reviewed by the honors instructor and a second reader to be selected based on the topic. Weekly progress reports required. (SP)

197. Field Studies. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience relevant to specific aspects of development studies in overseas organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Directed group study (upper division). (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Individual meetings. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by a faculty advisor. Enrollment is restricted by regulations of the college. (F,SP)

Donald J. DePaolo, Ph.D. California Institute of Technology. Isotope geochemistry
William E. Dietrich, Ph.D. University of Washington. Hillslope and fluvial geomorphology
Douglas W. Dekeyser, Ph.D. California Institute of Technology. Seismology, Earth structure, earthquake source physics
Irene Ying, Ph.D. Sc.D. Massachusetts Institute of Technology. Geophysical fluid dynamics, numerical modeling, biogeochemical cycles, remote sensing of Earth systems, atmospheric-ocean interactions
Bob B. Lyon, Ph.D. Stanford University. Paleoclimatology, reconstruction paleoceanography; marine, estuarine, and coastal environments, paleoceanography, paleoclimate
Raymond Jeanloz, Ph.D. California Institute of Technology. Ultra-high pressure/mineral physics
James W. Kitchin, Ph.D. University of California, Berkeley. Environmental geochemistry, watershed hydrogeology, geochemistry
Michael Manga, Ph.D. Harvard University. Geodynamics, volcanology, hydrology
James W. Rector III, Ph.D. Stanford University. Applied geodynamics
Mark A. Richards, Ph.D. California Institute of Technology. Geodynamics, gravity field and figure of the Earth, mantle convection, crustal deformation, teleseismic tomography
Barbara A. Romanowicz, Doctorat de Paris. Seismology, Earth, structure, seismology
George H. Brimhall Jr., (Emeritus), Ph.D.
Mark T. S. Bukowinski (Emeritus), Ph.D.
Ian S. E. Carmichael (Emeritus), Ph.D.
Garniss H. Curtis (Emeritus), Ph.D.
Mark A. Richards (Emeritus), Ph.D.
*Chi-yuen Wang (Emeritus), Ph.D.
*Hans-Rudolf Wenk (Emeritus), Ph.D.

Associate Professors
Richard Allen, Ph.D. Princeton University. Seismology, tectonics and associated sources of energy
Krista A. Boering, Ph.D. Stanford University. Atmospheric chemistry and dynamics
Eugene Chiang, Ph.D. California Institute of Technology. Theoretical astrophysics focusing on the origin and evolution of planetary systems, both extrasolar and solar

Assistant Professors
Burkhard Miltner, Ph.D. University of Illinois, Urbana-Champaign (UIUC). Planetary science and high-pressure physics
David M. Remp, Ph.D. Harvard University. Dynamics of tropical convection; global warming and the hydrological cycle; troposphere-stratosphere interactions; convective parameterizations; large-eddy simulations

Adjunct Professors
Steve Pride, Ph.D. Texas A&M. Crusted seismology, petrophysics, electrical properties of rocks, physics of brittle fracture
Morris Sloan, Ph.D. University of California, Berkeley. Stratigraphy, biostratigraphy, History of San Francisco Bay

Associate Adjunct Professors
David Alumbaugh, Ph.D. California Institute of Technology. Use of electromagnetic and mechanical methods for delineating structures and fluids in the Earth and developing computational algorithms for simulating and interpreting electromagnetic geophysical data
Simon Clark, Ph.D. Birbeck College, University of London. High pressure, high temperature meta morphic petrology

Professors-in-Residence
William Collins, Ph.D. University of Chicago. Global climate change, development and application of global Earth system models
Paul Renne, Ph.D. University of California, Berkeley. Chronology of tectonic and magmatic processes

Department Overview
The Department of Earth and Planetary Science (formerly Geology and Geophysics) offers a program of instruction that focuses on the origin, evolution, structure and dynamics of the Earth and other planetary bodies. This is an emerging discipline built from such fields as geology, geophysics, geochemistry, oceanography, and the atmospheric, environmental, and planetary sciences. Our undergraduate offerings are designed to provide core training in specialized topics as well as integrative courses that provide a broad overview. Beginning with an introduction to planet Earth, the underpinning of the major has seminal importance giving students many options for courses. Extensive opportunities are provided for field work, laboratory analysis, and theoretical instruction. Our upperdivision and graduate offerings are relatively small in size, allowing close interactions between students and faculty. Our undergraduate program provides strong technical training for those who wish to pursue professional careers in the Earth, environmental, and planetary sciences, but it also provides training in critical thinking and commu-
nication that serves well those who choose other paths, such teaching, law, resource management and other sciences. The graduate program is driven largely by collaborations in research with faculty who are leaders in their field.

### Major in Earth and Planetary Science

The Department of Earth and Planetary Science offers six specializations—astrophysics, environmental science, geology, geophysics, marine science, and planetary science—that lead to a bachelor’s degree. Students in the earlier major courses will have a departmental advisor. The department about their program. Lower-division prerequisite courses must be taken on a letter-graded basis (except when a course is offered only on a passed/not passed basis) and must be completed with a grade of C- or higher in each course. The department will allow one D grade in a lower division class as long as the student maintains at least a C average in the major.

### Atmospheric Science

**Atmospheric Science Adviser:** Kristie Boering, Ph.D.

This course of study (eps.berkeley.edu/undergraduate/atmos.php) explores the fundamental processes controlling atmospheric composition, circulation dynamics, and climate. Understanding how these processes have changed in the past and may change in the future are among the most intellectual and technological challenges of our time. Topics covered will include the physics of climate variability and climate change, changes in stratospheric ozone, columns of atmospheric chemistry and changes in the oxidation capacity of the troposphere, smog, and the impacts of atmospheric-biosphere-exosphere on atmospheric composition.

### Environmental Earth Science

**Environmental Earth Science Adviser:** B. Lynn Ingram, Ph.D.

The environmental earth science major is designed to provide students with a broad background in the earth sciences with an emphasis on environmental sciences. Interrelationships between physical, biological, and chemical processes at the Earth’s surface will be emphasized. The major focuses more broadly on the natural sciences by using earth science mainly as a base for expanding outward, depending upon students’ interests, by incorporating courses in biology, hydrology, hazardous waste management, ecology, and natural resources. The program is designed to provide background for graduate study in environmental science, preparation for work within governmental agencies such as the Environmental Protection Agency, Bureau of Land Management, United States Geological Survey or consulting firms, or a broader involvement in land use planning, business, policy, law, or management.

### Geology

**Geology Adviser:** Walter Alvarez, Ph.D.

Geology is the science of the Earth—of its minerals and processes, of its origin and evolution. It is a broad science concerned with a vast range of physical phenomena in both space and time, and requires a broad scientific background. Trained geologists can address a wide range of concerns, including natural resources, and environmental protection. This major provides strong background in the processes shaping the Earth; it emphasizes qualitative understanding and a strong foundation in the physical sciences.

### Upper Division:

- Math 1A-1B; Physics 7A-7B; Chem 1A; EPS 50.
- Upper Division: EPS 102, 104 or 121, 130, 150; plus 11 additional upper division units (see department for a list of electives).

### Geophysics

**Geophysics Adviser:** Douglas Dregger, Ph.D.

The geophysics major is designed to provide students with theoretical, field, and laboratory experience in studying geodynamic processes and the structure of the Earth and other planets. It is designed for students with good physics and mathematics abilities. A solid background in physical science and mathematics with an emphasis on the physics of the Earth.

### Lower Division:

- Math 1A-1B-53-54; Physics 7A-7B-7C; Chem 1A; EPS 50.
- Upper Division: EPS 102, 104 or 121, 130, 150; plus 11 additional upper division units (see department for a list of electives).

### Marine Science

**Marine Science Adviser:** Jim Bishop, Ph.D.

The ocean plays a central role in physical, biological, chemical, and geological processes on Earth. The field of marine science thus requires an understanding of the interactions between the biosphere, hydrosphere, lithosphere, and atmosphere. Some examples of the current research directions of societal concern in the marine sciences include: the role of the ocean in climate change; the ocean’s role in climate phenomena such as El Niño and La Niña, and their effect on modern marine ecosystems; the history of El Niño and other climatic events recorded in marine sediments and corals; coastal pollution and its affect of coastal marine ecosystems; coastal erosion (natural and human-caused).

### Lower Division:

- Math 1A-1B (or 16A-16B); Physics 7A-7B (or 8A-8B); Chem 1A; Biology 1B; EPS 50, C92.
- Upper Division: EPS 102, 150, and four courses from the following: EPS 100A, 100B, 103/203, 115, C146, IB 106, IB 106A; plus 8 additional upper division units (see department for a list of electives).

### Planetary Science

**Planetary Science Adviser:** Burkhard Milton, Ph.D.

Planetary science encompasses the study of the physical and chemical nature of planetary bodies, both in the Solar System and in extraterrestrial systems. The formation of planets; the forces that sculpted their orbits; the processes that shaped their interiors, surfaces, and atmospheres; and the development of life all fall under its rubric. Understanding these complex phenomena requires knowledge of astronomy and astrophysics, earth science, meteorology, atmospheric science, space science, plasma physics, chemistry, and biology.

The planetary science major has been developed to study the remarkable interface among these disciplines.

### Lower Division:

- Math 1A-1B-53-54; Physics 7A-7B-7C; Chem 1A; EPS 50.
- Upper Division: EPS 102, 150, C162; plus 14 additional upper division units (see department for a list of electives).

### Honors Program

Students in the Honors Program must fulfill the following additional requirements: (1) maintain a GPA of at least 3.3 in all courses in the major, and an overall GPA of at least 3.3 in the University; and (2) carry out an individual research or study project, involving at least three units of H195. The project is chosen in consultation with a department adviser, and a written report is judged by the student’s research supervisor and a department adviser. Application for the Honors Program should be made through the student’s adviser no later than the end of the student’s junior year.

### Minor in Earth and Planetary Science

### Lower Division:

- EPS 50 or equivalent.

### Upper Division:

- Five upper division courses chosen from the major list and approved by the major adviser. In consultation and with prior approval of the major adviser, students will have the opportunity to choose a coherent program that parallels the department’s major specializations or a general Earth and planetary emphasis. Course selections will be guided by the same parameters as those in each of the majors. At least three of the five upper division courses must be completed at Berkeley. No more than one of the five required courses for your minor may be included in your major program. All courses must be taken for a letter grade and a minimum 2.0 GPA is required in the upper division courses applied to the minor. Students interested in the minor should contact the student affairs officer in 305 McCone Hall.

### Graduate Programs

**Graduate Advisers:** Richard Allen, Ph.D., and Michael Manga, Ph.D.

The department offers M.A., M.S., and Ph.D. degrees in earth and planetary science. The central objective of the graduate program is to encourage the creative thinking and intellectual capacity for independent and original research. A strong undergraduate background in the sciences other than geology is especially helpful, and a significant number of our graduate students have their training in physics, chemistry, mathematics, engineering, or astronomy. Graduate students are formally accepted into the Earth and Planetary Science Program, and they normally work directly toward a Ph.D. A master’s degree is not prerequisite for a Ph.D.

**Master’s Degree.** Requirements for the Master of Arts degree consist of 24 semester units of upper division and graduate courses (at least 12 must be graduate, non-research units), followed by a comprehensive oral examination. The Master of Science degree is granted upon completion of 24 semester units of upper division and graduate courses (at least 8 units must be graduate, non-research units), and submission of a master’s thesis. The master’s thesis should be completed within four semesters (two years).

**Ph.D. Degree.** Candidates for the Ph.D. degree must pass the oral qualifying examination by the second year and complete a thesis to the satisfaction of the appointed thesis committee. Students must have two research proposi-
tions to present at the qualifying examination, each
developed under the supervision of a different pro-
pressor on substantially different topics.

Research Facilities

Center for Isotope Geochemistry (epg.berkeley. edu/cig), directed by Professor Donald DePaolo, is a joint research center of both UC Berkeley and Lawrence Berkeley National Laboratory. CIG provides state-of-the-art facilities for measuring the natural isotopic and isotopic compositions of elements in rocks, minerals, fluids, and gases in the Earth's crust, oceans, and atmosphere. CIG has seven mass spectrometers for measuring carbon, nitrogen, sulfur, and noble gases, and over 20 modern instruments for isotopic and isotope dilution analyses of Pb, Sr, Nd, Sm, Ca, K, Re, Os, Fe, U, Th, Pb, Ba, La, Ce; clean laboratories; and clean mineral separation and rock preparation laboratories. Materials analyzed are rock, ocean, and ground waters, and naturally occurring noble gases.

Berkeley Atmospheric Sciences Center (atmos. berkeley.edu) is a new multidisciplinary academic group at Berkeley. It focuses on the processes that maintain and alter the atmosphere's chemi-
cal composition and circulation. It also examines the climatic effects of changes in these processes. A special emphasis is the interaction between the geosystems and the atmosphere, as the cli-
nomover of changes at its boundaries, and the communicator of these changes to the other spheres. Center members and associates are from the Earth and Planetary Science; Chemistry; Environmental Science, Policy, and Management; Mechanical Engineer-
ing; and the Space Sciences Laboratory, Lawrence Berkeley National Laboratory, among others. Research approaches are multifaceted and include global 3-D circulation models, satellite observa-
tions, high-precision instrumentation for atmosphere-
pheric chemistry, aircraft measurements of stratospheric exchange, measurements and simulations of atmosphere-biosphere exchange of trace gases. This diversity permits the Center to pose and attack new questions about past and future climate change.

Berkeley Geomorphology Group (calm.geo. berkeley.edu/geomorph) prosper because of the diversity of strong research programs across the campus and because of a commitment to under-
graduate teaching and graduate training. The core faculty consist of Kurt Cuffey (Geography); William Dietrich, Jim Kirchner, and Michael Manga (Earth and Planetary Science). Their research programs tackle a variety of problems, including water, sediments, geomorphological processes, geomorphological dynamics, and biologic extinc-
tions and evolutionary processes. These faculty and their students interact and collaborate with many other related groups on campus.

Active Tectonics Research Group (seismo. berkeley.edu/~burgmann) uses an interdisciplinary approach to explore tectonic processes and the rheology of the Earth's lithosphere. This approach integrates geodetic, seismologic, geo-
morphic, and geologic observations with theoretical and dynamical models in order to study the tectonic processes associated with active faults. Research is being done in Northern California, and the Beaufort Sea, Alaska. The group's current research is focused on the interaction of tectonic and glacial forces in the evolution of the Alaskan Peninsula. This research is being done in collaboration with a number of other researchers at the University of California, Berkeley, and at the University of Alaska, Fairbanks.

Berkeley Geochronology Center (bgc.org) is a nonprofit research institution dedicated to estab-
lishing the sequence of Earth's evolution, its various inhab-
nants, and the rest of our solar system, through the 4.6 billion years of our

planet's existence. BGC scientists determine the ages of rocks and other materials to date important events in geological and biological history. Through understanding such information in geologic context, BGC research provides key insights into such processes as plate tectonics, volcanism, moun-
tain building, mass extinctions, climate change, and human civilization, and the evolution of life, including humankind.

Berkeley Seismological Laboratory (seismo. berkeley.edu): The University operates several networks of geophysical instruments in northern California to study earthquakes and tectonic pro-
cesses. The group currently operates more than 50 broadband seismometers regionally distributed and linked by continuous telemetry to UC Berkeley forms the core of the monitoring program. In addi-
tion, a network of short-period instruments and a network of borehole seismometers are maintained and operated by the lab, as well as an online archive for earthquake-related data in north-
ern California. Research includes the study of earthquake wave propagation through complex structures, the nature of earthquake sources, evolutions of the Earth and global tomography.

Center for Computational Seismology (seismo. berkeley.edu/node/364): Within the Earth Sciences Division and the Lawrence Livermore National Labo-
ratory is a facility for modern seismological research that relies heavily upon intensive com-
putational analysis (e.g., acoustic imaging, 3-D wave propagation, optimization of inverse earth-
quake analyses) or large database manipulations. The Center is used in a number of Ph.D. and post-
doctoral research studies.

Engineering Geoscient Group (teach) teaches and researches applied geophysics. It is an integral part of the Geophysics Group within the Department of Civil and Environmental En-
engineering at UC Berkeley. The group formed origi-
nally in 1962, to study and encourage the use of geophysical methods for engineering exploration programs. Recently, attention has shifted to the more general topic of subsurface mapping and imaging. While research in resource exploration topics is still actively pursued, the group’s activities now include work on methodology and instrument development for a variety of near surface applications related to the resolution of geotechnical and environmental problems. In this area, the group works jointly with the Department of Civil and Environmental Engineering on site remediation, near surface hydrology and soil sta-
ility. The center is concerned with the development of technol-
yes that control water supply to natural eco-
systems. (1)

C20. Earthquakes in Your Backyard. (3)
Two hours of lecture per week. Formerly Geology 3. An overview of the pro-
cesses that control water supply to natural ecosystems and human civilization. Hydrologic cycle, floods, droughts, groundwater. Patterns of water use, threats to water quality, effects of global climate change on future water supplies. Water issues facing Califor-
nia. (F,SP)

Analysis of basic principles and methods of seismology and geological tectonics, distribution of earthquakes in space and time, effects of earthquakes, and earthquake hazard and risk, with particular emphasis on the situation in California. (F,SP)

Lower Division Courses

2. Gems and Gem Materials. (1-3) One to three hours of session per week. The primary goal of the course is to present some introductory earth science and to provide students with a solid understanding of gemology. The course covers: (1) processes leading to the formation of gems in the Earth; (2) how gems are identified; (3) factors that affect the appearance of gems; (4) production of the appearance of gems; (5) materials used to simu-
late common gemstones; and (6) issues associated with the synthesis of gems. Information about each of the many gem groups of the United States is covered. The course requires its own textbook and practical (laboratory) work. (F,SP) Banfield

3. The Water Planet. (2) Two hours of lecture per week. Formerly Geology 3. An overview of the pro-
cesses that control water supply to natural ecosystems and human civilization. Hydrologic cycle, floods, droughts, groundwater. Patterns of water use, threats to water quality, effects of global climate change on future water supplies. Water issues facing Califor-
nia. (F,SP)

8. Geologic Record of Climate Change. (3) Three hours of lecture per week. Formerly Geology 8. This course will review the geologic record of climate change emphasizing how such knowledge can con-
tribute to current day thinking about (and models of) future climate change. We will cover the entire spectrum of climate variations, from the forma-
tion of the Earth's atmosphere 4.6 billion years ago to the ice ages, to the development of instru-
mental records. (F,SP)

C12. The Planets. (3) Students will receive no credit for C12 after taking N12, W12, Astronomy N12, or W12. Three hours of lecture per week. A tour of the mysteries and inner workings of our solar system. What are planets made of? Why do they orbit the sun the way they do? Do planets form, and what are they made of? Why do some bizarre moons have oceans, volanices, and ice flosses? What makes the Earth hospitable for life? Is the Earth a common type of planet or some cosmic quirk? This course will intro-
duce basic physics, chemistry, and math to under-
stand planets, moons, rings, comets, asteroids, atmospheres, and oceans. Understanding other worlds will help us save our own planet and help us under-
stand our place in the Universe. Also listed as Let-
ters and Science C70T and Astronomy C12. (F,SP)

Earthquakes in Your Backyard. (3) Two hours of lecture per week and one or more field trips. Formerly Geology 20. Introduction to earthquakes, their causes and effects. General discussion of basic principles and methods of seismology and geological tectonics, distribution of earthquakes in space and time, effects of earthquakes, and earthquake hazard and risk, with particular emphasis on the situation in California. (F,SP)

C20. Earthquakes in Your Backyard. (3) Two hours of lecture per week and one or more field trips. Intro-
duction to earthquakes, their causes and effects. Gen-
eral discussion of basic principles and methods of seismology and geological tectonics, distribution of earthquakes in space and time, effects of earthquakes, and earthquake hazard and risk, with particular emphasis on the situation in California. Also listed as Letters and Science C70Y. (F)

24. Freshman Seminar in Earth and Planetary Sci-
ences. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-4 to be graded on a pass/not pass basis. Sections 5-8 are to be graded on a passed/not passed basis. Formerly Geol-
ogy 24. The freshman seminar in earth and planetary science is designed to provide new students with an opportunity to explore a topic in geology or Earth sci-
ences with a faculty member in a small-seminar set-
ting. Topics will vary from semester to semester but will include such possible topics as great voyages of geo-
logic study and the role of atmospheric sciences in geologic study.

39. Freshman/Sophomore Seminar. Course may be repeated for credit. Sections 1-2 to be graded on a letter-grade basis. Sections 3-5 to be graded on a pass/not pass basis. Prerequisites: Permission given to freshmen and sophomores. Formerly Geology 39. Freshman and sophomore seminors offer lower divi-
sion students the opportunity to explore an intellec-
tual topic with a faculty member and a group of peers in a small seminar setting. These seminars are offered in all campus departments; topics vary from depart-
ment to department and from semester to semester.

50. The Planet Earth. (4) Three hours of lecture and three hours of laboratory per week. Formerly Geol-
ogy 50. An introduction to the physical and chemical processes that have shaped the Earth through time, with emphasis on the theory of plate tectonics. Labo-
atory work will involve the practical study of min-
ais, rocks, and geologic maps and exercises on geo-
ological processes. (F,SP)

51. Big History—Cosmos, Earth, Life, and Human-
ity. (4) Students will receive no credit for 51 after taking C51 or Letters and Science C70X. A deficient grade in C51 or Letters and Science C70X may be removed by taking 51. Three hours of lecture and one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Sophomore standing, except for freshmen who have previously taken 50. This course explores all four major regimes of history—cosmic history, Earth history, life history, and human history. Bringing together these normally un-
related topics, it seeks to understand the character of human history in terms of long-term trends and critical chance events, by looking for common causes under-
lying historical change in all four regimes, and by iden-
tifying the novelties that have made each regime unique. Unique lecture mechanism for students inter-
ested in any one of the historical disciplines, helping
them cross the barriers between fields of historical
study. (SP)

C51. Big History—Cosmos, Earth, Life, and Human-
ity. (4) Three hours of lecture and one hour of discus-
sion per week. Must be taken on a passed/not passed basis. Prerequisites: Sophomore standing, except for freshmen who have previously taken 50. This course explores all four major regimes of history—cosmic history, Earth history, life history, and human history. Bringing together these normally unre-
lated topics, it seeks to understand the character of history in terms of long-term trends and critical chance events, by looking for common causes under-
lying historical change in all four regimes, and by iden-
tifying the novelties that have made each regime unique. Unique lecture mechanism for students inter-
ested in any one of the historical disciplines, helping
them cross the barriers between fields of historical
study. Also listed as Letters and Science C70X. (SP) Alvarez

80. Environmental Earth Sciences. (2) Students will receive no credit for 80 after taking Integrative Biology 80 or Paleontology 15. Two hours of lecture per week. Formerly Geology 80. The course describes geologic processes active on and in the Earth and man's inter-
action with them. Geologic aspects of use of the land and oceans based on an understanding of Earth's
environmental processes. (F,SP)

C82. Introduction to Oceans. (2) Two hours of lec-
ture per week. The geology, physics, chemistry, and
biology of the world oceans. The application of oceanographic principles will be explored through special topics such as energy from the sea, marine pollution, food from the sea, and cli-
mate change. Also listed as Geography C82 and Inte-
rgrative Biology C82. (SP) Bishop

84. Sophomore Seminar. (1,2) Course may be repeated for credit at topic varies. One hour of semi-
inar per week per unit for 15 weeks. One and one-half
hours of seminar per week per unit for 10 weeks. Two
hours of seminar per week per unit for eight weeks.
Three hours per week per unit for six weeks. Sections 1-2 to be graded on a passed/not

prerequisite/course satisfies R&C requirement
R prerequisite/course satisfies R&C requirement
W prerequisite/course satisfies requirement
W prerequisite/course satisfies requirements
R prerequisite/course satisfies requirement
H prerequisite/honors course
B prerequisite/language course for business majors
I prerequisite/International course
AC prerequisite/course satisfies American Cultures requirement
AC prerequisite/course satisfies American Cultures requirement
118. Advanced Field Course. (4) Three hours of lecture and two hours of discussion per week, plus two-day field trip. Prerequisites: 50, 100A-100B, 101, or consent of instructor. Formerly Geology 118. To be repeated for credit. Formerly Geology 118. Advanced geological mapping, intensive field observation, and problem solving in the field areas selected by instructors. Includes preparation of final reports. (SP) Brimhall

119. Geologic Field Studies. (2) Course may be repeated for credit. Prerequisites: 101 and consent of instructor. Formerly Geology 119. Two to four-weekend field trips to localities of geological interest.

C120. Analysis of Environmental Data. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 11A, consent of instructor. Formerly Geology 120. Fundamentals of exploratory data analysis and hypothesis testing for environmental scientists, with emphasis on characterizing and evaluating uncertainty. Introduction to selected topics relevant to environmental analysis, including error propagation, design of experiments, and Monte Carlo methods. Microcomputer laboratories, using real environmental data, explore concepts and techniques presented in lecture. Also listed as Energy and Resources Group C130. (F) Kirchner

122. Physics of the Earth and Planetary Interiors. (3) Three hours of lecture per week. Prerequisites: Physics 105, Formerly Geophysics 122. Gravity field, density distribution, and internal structure of the Earth and planets. Constitution, composition, temperature distribution, and energetics of the Earth’s interior. The geomagnetic field, paleomagnetism, the geodynamo, and concepts in geophysical fluid dynamics.

124. Isotopic Geochemistry. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B, Mathematics 1A-1B. An overview of the use of natural isotopic variations to study earth, planetary, and environmental problems. Topics include: radiocarbon, cosmogenic isotope, studies of surficial processes, radiocarbon and the carbon cycle, water isotopes in the water cycle, and radiogenic and stable isotope studies of planetary evolution, oceans, lakes, groundwater, and geothermal systems. The course begins with a short introduction to nuclear processes and includes simple mathematical models used in isotope geochemistry. DePaolo

C129. Biometeorology. (3) Three hours of lecture per week. This course describes how the physical environment (light, wind, temperature, humidity) of plants and soil affects the physiological status of plants and how plants affect their physical environment. Using experimental data and theory, it examines physiological, biological, and chemical processes affecting change of momentum, energy, and material (water, CO2, and other gases) and how anthropogenic activity has affected these processes. Also listed as Science 170AC. (F) Baldocchi


131. Geochemistry. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A-100B, Chemistry 1A-1B, Formerly Geology 131. Chemical reactions in geological processes, and modern methods for predicting chemical equilibria in nature. Isotopic and chemical tracers of transport processes in the Earth. Chemistry of the solid Earth, oceans, and atmosphere.

C141. Paleoclimatology. (4) Three hours of lecture and two hours of discussion per week. Earth’s climatic changes have been substantial throughout geologic history, and these changes constitute fascinating natural experiments that reveal much about the Earth’s climate systems and their capacity for change. In this course, we will review important methods for past climatic reconstruction and also current knowledge of past climate changes throughout Earth’s history, with an emphasis on those of the Quaternary. Methods to be explored include analyses of physical, geochemical, and paleoecological characteristics of marine sediments, coral reefs, coastal sediments, lake sediments, trees, and ice cores. Also listed as Geography C141. Cuffey, Ingram

C146. Geological Oceanography. (4) Three hours of lecture and three hours of laboratory per week. Formerly Geology C145. The tectonics and morphology of the sea floor, the geologic processes in the deep and shallow oceans, and the climatic record contained in deep-sea sediments. The course will cover sources and composition of marine sediments, sea-level change, ocean circulation, paleoenvironmental reconstruction of the sea floor, and the role of fossil fuel emissions and climate change on marine sediments, marine stratigraphy, and ocean floor resources. Also listed as Geography C145. Ingram

150. Case Studies in Earth Systems. (2) Two hours of lecture per week. Prerequisites: 50, senior standing or consent of instructor. Analysis and discussion of three research problems on the interactions of solid earth, hydrologic, chemical, and atmospheric processes. Emphasis is on the synthesis and application of the student’s disciplinary knowledge to a new integrative problem.

C162. Planetary Astrophysics. (4) Three hours of lecture per week. Prerequisites: Mathematics 53, 54; Physics 7A-7B-7C. Physics of planetary systems, both solar and extra-solar. Star and planet formation, radioactive dating, small-body dynamics and interactions of the interstellar medium, interplanetary dust, atmospheres, and magnetospheres. High-quality oral presentations may be required in addition to problem sets and a final exam. Also listed as Astronomy C162. Chiang, de Pater, Mann

170AC. Crossroads of Earth Resources and Society. (4) Three hours of lecture and one hour of discussion per week. Formerly 106AC. Intersection of geological processes with American cultures in the past, present, and future. Overview of ethnogeology including traditional knowledge of sources and uses of Earth materials and their cultural influences today. Scientific approach to study of tectonic controls on the genesis and global distribution of energy fuels, metals, and industrial minerals. Evolution and diversity of opinion in attitudes about resource development, environmental management, and conservation; social, cultural, and historical implications of natural and human resource use. Impending crisis in renewable energy and the imperative of resource literacy. Also listed as Letters and Science 170AC. This course satisfies the American Cultures requirement. Brimhall

C171. Geoastronomy. (4) Three hours of lecture per week. Formerly Geophysics 171. Advanced course in geology and astronomy. The course includes field and laboratory studies in analytical chemistry, geology, petrology/petrography, and a survey of dating materials in archaeology, the historical development of geoastronomy, and other aspects of archeological and physical earth sciences as applied to geoastronomical materials. Also listed as Anthropology C131. (F,SP)

C178. Applied Geophysics. (3) Two hours of lecture and three hours of laboratory/exercise per week. Prerequisites: Mathematics 53, 54, Physics 7A, 7B and 7C, or equivalent. Formerly Geology Engineering C145, 145L; Earth and Planetary Sciences C145, 145L; and Material Science C145, 145L. The theory and practice of geophysical methods for the exploration of the surface of the earth and of the Moon and other planets. Measurements of gravity and magnetic fields, electrical and electromagnetic fields, and seismic velocity are interpreted to map the subsoil and bedrock. Also listed as Geological Engineering C178. (F) Rector

C180. Air Pollution. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B and Physics 8A or consent of instructor. Advanced study of pollutants in the atmosphere of Earth’s atmosphere. We will focus on the fundamental natural processes controlling trace gas and aerosol concentrations in the atmosphere, atmospheric chemistry, and biogeochemical cycles, and those processes at the local, regional, and global scales. Specific topics include stratospheric ozone depletion, increasing concentrations of greenhouse gases, smog, and changes in the oxidation capacity of the troposphere. Also listed as Environ Sci, Policy, and Management C180 and Civil and Environmental Engineering C106. (F) Goldstein

C181. Atmospheric Physics and Dynamics. (3) Three hours of lecture/discussion per week. Prerequisites: Mathematics 53, 54, Physics 7A-7B-7C. Formerly 181. This course examines the processes that determine the structure and circulation of the Earth’s atmosphere. The approach is deductive rather than analytical. Topics include the role of water in the energy and radiation balance; governing equations for atmospheric motion, mass conservation, and thermodynamic energy balance; geostrophic flow, quasigeostrophic motion, baroclinic instability, and dynamics of large-scale atmospheric phenomena. Also listed as Geography C139. Chiang, Fung

C182. Atmospheric Chemistry and Physics Laboratory. (3) Students will receive 1 unit of credit for C182 after taking 125. One hour of lecture and five hours of laboratory per week. Prerequisites: 50 or 102 with grades of C- or higher (one of which may be taken concurrently) or two of the following: Chemistry 120A, 120B, C130, or 130B with grades of C- or higher (one of which may be taken concurrently). Fluid dynamics, radioactive dating, and the kinetic theory of gases. Spectroscopy, and measurement of atmospherically relevant species are explored through laboratory experiments, numerical simulations, and field observations. Also listed as Chemistry C182. (SP)

185. Marine Geology. (2) Two hours of lecture per week. Formerly Geology 185. Interrelationships between marine organisms and physical, chemical, and geological processes in oceans. (F) Berry

H195. Senior Honors Course. (3) Individual conferences. Prerequisites: Limited to honors candidates. Formerly Geology H195. Directed study of a topic in an Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and declared major in Earth and planetary science. Written proposal signed by faculty sponsor and approved by major faculty adviser. Supervised experience relevant to specific aspects of student’s EPS specialization in off-campus organization. Renewal of permission for one unit. Major faculty sponsor and written report required. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings of various lengths. Must be taken on a passed/not passed basis. Formerly Geology 198. Group studies of selected topics which vary from semester to semester.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Formerly Geology 199. Enrollment is restricted by regulations. (F,SP)

Graduate Courses


202. Thermodynamic Analysis of Chemical Reactions in Natural Processes. (3) Three hours of lecture per week. Prerequisites: Mathematics through differential equations and an upper division background in chemistry or geochemistry. Formerly Geology 202. Application of statistical thermodynamics and solution chemistry to prediction and interpretation of the consequences of both reversible and irreversible reactions in inorganic and organic processes.

203. Introduction to Aquatic and Marine Geochemistry. (4) Three hours of lecture and a field trip. Prerequisites: Chemistry 1A, Mathematics 1A, or 16A. C202 recommended. Introduction to marine geochemistry: the global water cycle; processes governing the distribution of chemical species within the hydrosphere; ocean circulation; chemical mass balances, fluxes, and reactions in the marine environment from global to submicron scales; carbon system equilibrium chemistry and biogeochemistry of fresh and salt water; applications of isotopes to environmental and anthropogenic organic and radioactive tracers; internal ocean processes.

204. Elastic Wave Propagation. (3) Three hours of lecture per week. Prerequisites: 104 or equivalent; 121; Physics 105. Formerly Geophysics 204. Wave propagation of elastic solids; effects of anisotropy and anisotropy; representation theorems; reflection and refraction; propagation in layered media; finite-difference and finite-element methods.

207. Laboratory in Observational Seismology. (3) Three hours of lecture plus two hours of laboratory per week. Prerequisites: 121 or 130 or 204 or consent of instructor. Formerly Geophysics 207. Group problem solving of current seismological topics. Analysis, inversion, and numerical modeling of seismic wave data to test questions regarding the physics of the earthquake source and seismic wave propagation. Application of current developments and techniques in seismological research.

220. MATLAB Applications in Earth Science. (2) One hour of lecture and one hour of computing laboratory per week. Prerequisites: Some programming experience in any language. Introduction to MATLAB programming with toolboxes. Applications come from Earth sciences and related fields including biology. Topics range from image processing, riverbed characterization, landside risk analysis, signal processing, geospatial and seismic data analysis, and machine learning, to data analysis and visualization. Designed for beginning graduate students. (SP)

210. Exploration, Ore Petrology, and Geochemistry. (4) Three hours of lecture and three hours of laboratory per week plus six days of field trips. Prerequisites: 101 or 271; 1004-100B: 118 recommended. Formerly Geology 210. Overview of geological, petrological, and geochemical analysis of ore forming processes including sedimentary, magmatic, hydrothermal, and geothermal resources. Geochemical rock budget and the significance of mineral phase equilibria. The geochemistry of near sea surface oxidation of primary ores related to climate change, hydrological evolution, and tectonics. Exploration for Earth materials for commercial technologies including natural phase equilibria. Multiple junction semiconductor photo-voltaic cells. Mass balance modeling of ore-forming systems and soils. Environmental management of exploration sites. Lab activity will involve a comprehensive field trip covering the oceanic floor and rock mechanics.

211. Advanced Stratigraphy and Tectonics. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Geology 212. Evolution of the Earth in response to internal, surficial, and extraterrestrial processes. Lecture and three hours of laboratory per week. Prerequisites: Mathematics through differential equations and an upper division background in chemistry or geochemistry. Formerly Geology 213. Field Geology and Digital Mapping. (4) Seven hours of fieldwork and two hours of lecture per week. Prerequisites: 50 or equivalent. Welcome to Introduction to planet Earth for science majors. Geographical mapping, field observation, and problem solving in the Berkeley hills and envisions leading to the development of appropriate methods and applications in core processes and history from stratigraphic, structural, and lithological investigations. Integration of the Berkeley hills geography into the coast ranges and California as a whole through geospatial and geomechanical modeling. Integration of digital field mapping and use of global positioning systems. Interdisciplinary focus encourages participation by nonmajors. (SP) Brinnhall

216. Active Tectonics. (3) Three hours of lecture per week. Prerequisites: 116 or equivalent, Physics 1A or equivalent, or consent of instructor. Formerly Geology 207. This course is a graduate course designed to introduce students in the Earth sciences to the geology of earthquakes, including tectonic geomorphology, paleoseismology and the analysis and interpretation of geodetic measurements of active deformation. While the focus will be primarily on seismically active faults, we will also discuss deformation associated with landfills and reservoirs as a means of identifying the effects of large-scale and small-scale processes. For nonmajors. (SP) Brinnhall

217. Fluvial Geomorphology. (4) Course may be repeated for credit. Three hours of lecture and two hours of laboratory per week; some fieldwork is assigned. Prerequisites: Consent of instructor. Formerly Geophysics 217. Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Geophysics 220. A combined seminar and lecture course covering advanced topics related to mineral physics, examination of geophysical and mineralogical problems. Topics will cover the principles of isotopic distribution on Earth (first 10 weeks). Students prepare summaries of choice for isotopic analyses. Also listed as Environ Sci, Policy, and Management C220 and Integrative Biology C227. (SP) Staff

224. Glaciology. (4) Three hours of lecture and one hour of consultation per week. Prerequisites: Calculus. A review of the mechanics of glacial systems, including formation of ice masses, glacial flow mechanisms, subglacial hydrology, temperature and heat transport, glacial deformation, and glaciers. We will use this knowledge to examine glaciers as geomorphological agents and as participants in climate change. Also listed as Geography C241. Cuffey

239. Solar System Astrophysics. (3) Three hours of lecture per week. The physical foundations of planetary systems. Topics include planetary interiors and surfaces, planetary atmospheres and magnetospheres, and smaller bodies in our solar system. The physical processes at work are developed in two parts; a theoretical overview of the solar system—and each class of objects—is developed. Some discussion of other (potential) planetary systems is also included. Also listed as Astronomy C249. Chiang, de Pater

250. Advanced Topics in Earth and Environmental Sciences. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Formerly Geology 250. Review of recent literature and discussion of ongoing research between Earth science and environmental science.

251. Carbon Cycle Dynamics. (3) Six hours of lecture per week. Formerly Geology 219. In this course, we will focus on the (unsolved) puzzle of the contemporary carbon cycle. Why is the concentration of atmospheric CO2 changing at the rate observed? What are the terrestrial and oceanic processes that add and remove carbon from the atmosphere? What are the processes responsible for long-term storage of carbon on land and in the ocean? Possible ways to address these questions include computer models of carbon cycles, climate feedbacks, climate sensitivity, and response times. Also listed as Integrative Biology C229. (SP) Fung, Powell
254. Advanced Topics in Seismology and Geophysics. (1) Course may be repeated for credit. One hour of lecture per week. Formerly Geophysics 250. Lectures on various topics representing current advances in seismology and geophysics, including local crustal and earthquake studies, regional tectonics, structure of the Earth’s mantle, and core and global dynamics.

255. Advanced Topics in Earth and Planetary Science. (1) Course may be repeated for credit. One- and one-half hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Lectures on various topics representing current advances in all aspects of Earth and planetary science.

256. Earthquake of the Week. (2) Course may be repeated for credit. Two hours of discussion per week. Formerly Geophysics 255. Each week, the seismicity of the previous week, in California and worldwide, is reviewed. Tectonics of the region as well as source parameters and waveforms of interest are discussed and placed in the context of ongoing research in seismology.

260. Research in Earth Science. (2) Course may be repeated for credit. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Geophysics 260. Weekly presentations to introduce new graduate students and senior undergraduates to current research conducted in the Department of Earth and Planetary Science.

271. Field Geology and Digital Mapping. (4) Students will write a textbook on field mapping and digital mapping techniques. Seven hours of fieldwork and two hours of lecture per week. Prerequisites: 50 or equivalent introductory course for majors. Geological mapping, field observation, and problem solving in the Berkeley hills and environs leading to original interpretation of geological processes and history from stratigraphic, structural, and lithological investigations. Integration of the Berkeley hills geology into the tectonic and paleoclimatic record of the Coast Ranges and California as a whole through systematic field mapping in key localities and reading of original literature. Training in digital field mapping, use of digital base maps, and use of global positioning systems. (SP) Brinhall

C276. Seismic Hazard Analysis and Design Ground Motions. (3) Three hours of lecture per week. Prerequisites: Basic knowledge of earthquakes and probability theory or consent of instructor. Deterministic and probabilistic seismic hazard analysis. Separation of uncertainty into aleatory variability and epistemic uncertainty. Discussion of seismic source and ground motion characterization and hazard computation. Development of time histories for dynamic analyses of structures and seismic risk computation, including selection of ground motion parameters for estimating structural response, development of fragility curves, and methods for risk calculations. Also listed as Civil and Environmental Engineering C276. (SP) Abrahamson

280. Research. (2-12) Course may be repeated for credit. Formerly Geology 280. Individual conferences to be arranged. Provides supervision in the preparation of an original research paper or dissertation. (F,SP)

290. Seminar. (2-6) Course may be repeated for credit. One hour of discussion per week. Seminar may be repeated for credit. Two and one-half hours of lecture and one hour of discussion per week. Prerequisites: One course in introductory biology, geology, chemistry, physics, or marine science required and interest in ocean science; junior, senior, or graduate standing; consent of instructor required for sophomores. For graduate students interested in improving their ability to communicate their scientific knowledge by teaching ocean science in elementary schools or science centers/aquariums. The course will combine instruction in inquiry-based teaching methods and learning pedagogy with six weeks of supervised teaching experience in a local school classroom or the Lawrence Hall of Science with a partner. Thus, students will practice communicating scientific knowledge and receive mentoring on how to improve their presentations. Also listed as Geography C301 and Integrative Biology C215. (SP) Ingram

East Asian Languages and Cultures (College of Letters and Science)

Department Office: 3413 Dwinnell Hall, (510) 642-3480 easc.berkeley.edu
Chair: Alan Tansman, Ph.D.

Professors
- Mark Caliskan-Tsirulsky, Ph.D. Stanford University. Early Chinese thought and literature
- H. Mack Horton, Ph.D. University of California, Berkeley. Classical Japanese literature
- Robert Sharf (The D. H. Chen Distinguished Professor of Buddhist Studies), Ph.D. University of Michigan. Buddhist studies
- Alan Tanman (The Louis B. Agassiz Professor of Japanese), Ph.D. Yale University. Modern Japanese literature
- Haruo Aoki (Emeritus), Ph.D.
- Cyril Birch (The Louis B. Agassiz Professor of Chinese Emeritus), Ph.D.
- Kun Chang (Emeritus), Ph.D.
- John C. Jamieson (Emeritus), Ph.D.
- David N. Keightley (Emeritus), Ph.D.
- Lewis R. Lancaster (Emeritus), Ph.D.
- Susan Matsumo (Emerita), Ph.D.
- Jeffrey K. Riegel (The Louis B. Agassiz Professor of Chinese Emeritus), Ph.D.
- Pang-Hsin Ting (Emeritus), Ph.D.
- Steven West (The Louis B. Agassiz Professor of Chinese Emeritus), Ph.D.

Associate Professors
- Robert Ashmore, Ph.D. Harvard University. Classical Chinese literature
- Yoko Hasegawa, Ph.D. University of California, Berkeley. Japanese linguistics
- Andrew Jones (The Catherine and William L. Magistretti Distinguished Professor in East Asian Languages and Cultures), Ph.D. University of California, Berkeley. Modern Chinese literature and popular culture
- Cuong D. O’Neill, Ph.D. University of California, Berkeley. Modern Japanese literature
- Paula Varsano, Ph.D. Princeton University. Classical Chinese literature
- Sophie Volpe, Ph.D. Harvard University. Modern literature, comparative literature
- Duncan Ryuken Williams, Ph.D. Harvard University. Buddhist studies
- James E. Bosson (Emeritus), Ph.D.

Assistant Professors
- Jacob Dalton, Ph.D. University of Michigan. Buddhist studies
- Ji Won Shin, Ph.D. Harvard University. Korean literature

The Undergraduate Majors

The Department of East Asian Languages and Cultures offers undergraduate majors in the languages and cultures of China and Japan: minors in Chinese, Japanese, Korean, and Buddhism; and Honors Programs; all of which introduce the vast and variegated literary, artistic, philosophical, and cultural legacies of East Asia and their transformations in modernity. The courses of study are designed to train students in the humanistic investigation of major East Asian traditions, through a curriculum that centers on the acquisition of the modern and classical forms of the languages, the informed and engaged reading of a wide variety of East Asian texts in their historical and cultural contexts, and the development of effective writing skills and critical thinking.

Chinese

Prerequisites (must earn a grade of C or higher):
- Chinese 1A, 1B (5, 5): Elementary Chinese
- Chinese 7A or 7B (4): Introduction to Chinese Literature (must be taken at Berkeley)

Lower Division (minimum of three courses and 12 units):
- Chinese 10A, 10B (5, 5): Intermediate Chinese
- Chinese 7A or 7B (4): Introduction to Chinese Literature (whichever was not taken as a prerequisite)

Upper Division (minimum of eight courses and 32 units; minimum GPA of 2.0):
- Chinese 100A, 100B (5, 5): Advanced Chinese
- Chinese 110A, 110B (4, 4): Introduction to Literary Chinese
- One modern Chinese literature course: Chinese 155, 156, or 157
- One East Asian languages upper division course: e.g., EA 100, 102
- Two electives selected in consultation with the adviser.

Total units required: 62

Japanese

Prerequisites (must earn a grade of C or higher):
- Japanese 1A, 1B (5, 5): Elementary Japanese
- Japanese 7A or 7B (4): Introduction to Japanese Literature (must be taken at Berkeley)

Lower Division (minimum of three courses and 12 units):
- Japanese 7A or 7B (4): Introduction to Japanese Literature (whichever was not taken as a prerequisite)

Upper Division (minimum of eight courses and 32 units; minimum GPA of 2.0):
- Japanese 100A, 100B (5, 5): Advanced Japanese
- Japanese 120: Introduction to Classical Japanese
- One classical Japanese literature course: Japanese 130, 132, 134, 140, 142, 144, 146
- One modern Japanese literature course: Japanese 155 or 159
- One East Asian languages upper division course: e.g., EA 100, 102
- Two electives selected in consultation with the adviser.

Total units required: 62

Note: Students with previous language experience will be required to take a placement exam with department language coordinators. Students who place out of language courses will be required to
take additional adviser-approved literature or culture courses offered by the department in order to meet the above unit requirements.

The Undergraduate Minors
The Department of East Asian Languages and Cultures offers four minor programs: Buddhism, Chinese, Japanese, and Korean. Each minor requires 20 units and five upper division courses (except where otherwise noted) in addition to fourth-semester language proficiency.

Minor in Buddhism: Proficiency in Chinese or Japanese equivalent to 10B. (Other relevant Asian languages may be substituted with adviser approval.) Required for minor: Division courses—three courses in Buddhism; two additional courses chosen in consultation with the adviser. Buddhism 50 may be substituted for one of the five courses.

Minor in Chinese: Chinese 10B or equivalent. Five upper division courses: three courses in Chinese; two additional East Asian language courses. Either 7A or 7B may be substituted for one of the five courses.

Minor in Japanese: Japanese 10B or equivalent. Five upper division courses: three courses in Japanese; two additional East Asian language courses. Either 7A or 7B may be substituted for one of the five courses.

Minor in Korean: Korean 10B or equivalent. Five upper division courses: three courses in Korean; two additional East Asian language courses. Either 7A or 7B may be substituted for one of the five courses.

Note: All minor courses require adviser approval and must be taken for a letter grade.

Honors Program
A senior undergraduate student who has completed 12 units of upper division language courses in the department, and who has a GPA of 3.5 in those courses and an overall average of 3.0 may apply for admission to the Honors Program. If accepted, the student will enroll in an honors course (any H195 course) for two consecutive semesters leading to the completion of an honors thesis, which must be submitted at least two weeks before the end of the semester in which the student expects to graduate. While enrolled in the Honors Program, the student will undertake independent advanced study under the guidance of the student’s honors thesis adviser. Upon completion of the honors course, a faculty committee will determine the degree of honors to be awarded (honors, high honors, highest honors), taking into consideration the overall performance in the thesis and overall performance in the department. Honors will not be granted to a student who does not achieve a minimum cumulative GPA of 3.3 in all undergraduate work in the University by the time of graduation.

Graduate Programs
M.A. and Ph.D. programs are offered in Chinese language and literature and in Japanese language and literature. Within either area of specialization, students may focus on literary criticism, comparative studies, cultural history, linguistics, a specified period, or the like, but in every case students will be expected to acquire a solid grounding in the classical and modern versions of the primary language.

The primary purpose of our degree training is to prepare students to become scholars and teachers of advanced courses at the university level. Persons aiming solely at modern-language teaching will not find the program suited to their needs.

Information about the graduate program can be obtained from the department office.

**East Asian Languages**

### Lower Division Courses

**C50. Introduction to the Study of Buddhism. (4)** Three hours of lecture per week. This introduction to the study of Buddhism will consider materials drawn from various Buddhist traditions of Asia, from ancient times down to the present. It is not intended to be a comprehensive or systematic survey; rather than aiming at breadth, the course is designed around key themes such as ritual, image veneration, mysticism, meditation, and the overlapping emphasis throughout the course will be on the hermeneutic difficulties attendant upon the study of religion in general, and Buddhism in particular. Also listed as South and Southeast Asian Studies C52 and in Group in Buddhist Studies C52 (F,SP) Staff

**98. Directed Group Study for Lower Division Students. (1-4)** Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing, 3.5 GPA. Small-group instruction in topics not covered by regularly scheduled courses. (F,SP) Staff

**99. Independent Study for Lower Division Students. (1-4)** Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing, 3.5 GPA. Independent study in topics not covered by regularly scheduled courses. (F,SP) Staff

### Upper Division Courses

**100. Reading Alternative Space. (4)** Three hours of lecture per week. This course is a wide-ranging investigation of contemporary East Asia and its cultural and social contexts. We will explore the consequences of modernity in East Asia and the role of cities and urban spaces in shaping the region's future. The course will focus on key themes such as modernization, globalization, and cultural identity.

**104. Tales of Two Empires: Literature and History in the Chinese 19th Century. (4)** Three hours of lecture per week. The Chinese 19th century was a tumultuous and pivotal era, one which witnessed both the zenith and the nadir of the Qing dynasty. The complex and violent encounter between a Chinese empire and the forces of global imperialism, and the consequent advent of a new colonial modernity in China. In this course, we will study these world-historical transformations as they are registered and represented in literary, historical, and visual texts produced both in China and Victorian England. (F,SP) Jones

**105. Dynamics of Romantic Core Values in East Asian Premodern Literature and Contemporary Film. (4)** Three hours of lecture per week. This course explores the representation of romantic love in East Asian literary and visual texts. We will examine how romantic relationships are represented in various contexts. Students will develop a better understanding of the similarities and differences in traditional values in three East Asian cultures by comparing how canonical literary and modern Chinese texts represent romantic relationships. They explore how these values sometimes provide a given framework for a narrative and sometimes provide the definition of transgressive. This course is followed by a study of late-contemporary East Asian films, giving the student the opportunity to explore how traditional values persist, change, or become nexus points of resistance in the complicated modern and post-modern milieu of East Asian cultures maintaining a national identity while exercising an international presence. (F,SP)

**106. Expressing the Ineffable in China and Beyond: The Making of Meaning in Poetic Writing. (4)** Three hours of lecture per week. This course will explore the Chinese- and Japanese-language literary traditions (broader defined) delineate the realm of the ineffable, and how cultural notions of the inexpressible shape the writing and reading of poems, songs, and a variety of other genres. We will examine figures of speech and imagery, as well as the poetics of the figurative language and prosody to genre and canon formation. In addition, in order to deepen our understanding of how writing achieves its aims, some attention will be given to nonverbal modes of expression, including calligraphy and painting—and attempts to render them in writing. Over the course of this study, students will not only refine their sensitivity to the power of artistic modern expression but also develop an in-depth reading, analytical writing, and oral expression. All readings will be in English. (F,SP)Varsano

**107. War, Empire, and Literature in East Asia. (4)** Three hours of lecture per week. This course will examine war, empire, and the writing and memorialization of history through an eclectic group of literary, graphic, and cinematic texts from China, Japan, Europe, and the United States. We will begin by examining crucial issues of imperial power, violence, and historical representation through the lens of the Han dynasty historian Sima Qian’s classic accounts of “terror” in the Warring States period, the rise of the Han empire, and its conflicts with the Hsung-nu “barbarians” in the north. With these examples in mind, we will turn our focus to two crucial conflicts in modern history—the Boxer Uprising of 1899-1900 and the Sino-Japanese War of 1937-1945—and their multiple representations across a number of different times, places, and media. (F,SP)Jones

**108. Revising the Classics: Chinese and Greek Poetry in Translation. (4)** Three hours of lecture per week. An introductory course on Chinese poetry, both ancient and modern, in English translation. The course will explore poetic translation, across languages, across cultures, and across historical ages, not merely from the perspective of the “accuracy” with which a classic text is represented in the translation, but as a window into the nature of poetic translation and poetic writing itself. Works to be covered in the course will be primarily drawn from the Chinese tradition, but in the interest of allowing a comparative discussion of the course on the central theme of the interplay of the two approaches, also in translation, from ancient and modern Greek poetry will be included as well. The goal of the class is not simply to gain familiarity with Chinese poetry and literature but to acquire a more fundamental understanding of translation and sophistication in reading, responding to, and thinking about poetry. (F,SP)Ashmore

**109. History of the Culture of Tea in China and Japan. (4)** Three hours of lecture per week. The course takes the traditions of tea in China and Japan as a way of viewing cultural and historical differences between the two countries. It explores aes-
C120. Buddhism on the Silk Road. (4) Three hours of lecture per week. Formerly Buddhism 115. This course is both an historical introduction to the Silk Road, understood as an ever-changing series of peoples, places, and events as well as an introduction to the study of those same peoples, places, and traditions in the modern period. In this way, the class is intended both as a guide to the extant textual, archaeological, and art historical evidence from the Silk Road, but also as a framework for thinking about what it means to study Asia and Asian religions in the context of a contemporary American classroom. All readings will be in English. (Also listed as Group in Buddhist Studies C120. (F,SP). Staff)

C122. Buddhism Meditation: Historical, Doctrinal, and Ethnographic Perspectives. (4) Three hours of lecture and one hour of discussion per week. This course will explore the nature and function of Buddhist meditation as it developed within various Buddhist traditions of South, Southeast, and East Asia. Emphasis will be on the historical evolution, doctrinal foundations, and monastic and extra-monastic regimens associated with Buddhist meditation practices. We will make use of a wide variety of primary and secondary readings as well as visual materials (including films) to attempt to place the historical and doctrinal accounts within their cultural and institutional contexts. Also listed as Group in Buddhist Studies C122. (F,SP) Staff

C124. Buddhism and Film. (4) Two to three hours of lecture and three to four hours of discussion/film screening per week. This course will use the medium of film to explore various themes in the study of Buddhism. At the same time, we will use ideas culled from Buddhism to reflect back on the nature and power of film. We will be screening a wide variety of international and domestic films, from Hollywood blockbusters to small independent films and documentaries. Themes to be considered include the epistemic status of the viewing subject, the place of imagination and visualization in meditation and ritual, contests of Asian and Western notions of Buddhist authority, Orientalism, and the role of projection and fantasy in cinematic representations of Buddhism. The films will be accompanied by secondary readings on Buddhism in history and literature, religious studies, and film theory. Also listed as Group in Buddhist Studies C124. (F,SP) Staff

C126. Buddhism and the Environment. (4) Three hours of lecture per week. Prerequisites: One lower-division course in Buddhism Studies or consent of instructor. A thematic course on Buddhist perspectives on nature and Buddhist responses to environmental issues. The first half of the course focuses on East Asian Buddhism as a cultural and doctrinal perspective on the place of the human in nature and the relationship between the salvific goals of Buddhism and nature. The second half of the course examines Buddhist ethics, economics, and activism in relation to environmental issues in contemporary Southeast Asia, East Asia, and America. Also listed as Group in Buddhist Studies C126. (F,SP) Williams

C128. Buddhism in Contemporary Society. (4) Three hours of lecture per week. A study of the Buddhist tradition in contemporary Asia. The course will focus on specific living traditions of East, South, and/or Southeast Asia. Themes to be addressed may include contemporary Buddhist ritual practices; funerary and memorial rituals; and the relationship between Buddhist and other local religious traditions; the relationship between Buddhist institutions and the state; Buddhist monasticism and its relationship to the laity; Buddhist ethics; Buddhism “modernism,” and so on. Also listed as South and Southeast Asian Studies C145 and Group in Buddhist Studies C128. (F,SP) Staff

C130. Zen Buddhism. (4) Three hours of lecture and one hour of discussion per week. This course will introduce students to the Zen Buddhist traditions of China and Japan, drawing on a variety of disciplinary perspectives (history, anthropology, philosophy, and so on). The course will also explore a range of hermeneutic problems (problems involved in interpretation) and attempt to understand a sophisticated religious tradition that emerged in a time and culture very different from our own. Also listed as Group in Buddhist Studies C130. (F,SP) Staff

C135. Tantric Traditions of Asia. (4) Three hours of lecture per week. Prerequisites: One course in Buddhist Studies; or consent of instructor. The emergence of the tantras in seventh- and eighth-century India marked a watershed for religious practice throughout Asia. These esoteric scriptures introduced complex new ritual technologies that transformed the religious traditions of India, from Brahmanism to Jainism and Buddhism as well as those of Southeast Asia, Tibet, Mongolia, China, Korea, and Japan. This course will provide an introduction to tantric religions across these regions. Also listed as Group in Buddhist Studies C135 and South and Southeast Asian Studies C135. (F,SP) Staff

180. East Asian Film: Directors and their Contexts. (4) Course may be repeated for credit. Three hours of lecture and one to two hours of discussion/film viewing per week. Prerequisites: Upper division or graduate standing. A close analysis of the oeuvre of an East Asian director in his aesthetic, cultural, and political contexts. (F,SP)

181. East Asian Film: Special Topics in Genre. (4) Three hours of lecture and one to two hours of discussion/film viewing per week. The study of East Asian films as categorized either by industry-identified genres (westerns, horror films, musicals, film noir, etc.) or broader interpretive modes (melodrama, realism, fantasy, etc.). (F,SP)

198. Directed Group Study. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Course may be repeated for credit. Three hours of discussion/film viewing per week. Prerequisites: Upper division or graduate standing. A close analysis of the oeuvre of an East Asian director in his aesthetic, cultural, and political contexts. (F,SP)

199. Independent Study. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Junior or senior standing. Small-group instruction in topics not covered by regularly scheduled courses. (F,SP) Staff

200. Proseminar: Approaches to East Asian Studies. (2,4) Three hours of seminar per week. This course is a pro-seminar required for all entering graduate students in the Department of East Asian Languages and Cultures. It is designed to familiarize graduate students with the primary sources used in the study of Chan and Zen Buddhism. It is designed to be of interest to a range of graduate students working on pre-modern Chinese and Japanese culture (literature, philosophy, intellec
tual history, religion, art, etc.). The course will also introduce students to Asian and Western language reference tools for the study of East Asian Buddhist texts, including web resources. The content of the course will vary from semester to semester to best accommodate the needs and interests of students. Also listed as Group in Buddhist Studies C240. (F,SP) Sharf

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Chinese

Instructor approval is recommended for enrollment in language courses.

Courses numbered 180-189 are lecture courses given in English.

Lower Division Courses

1A-1B. Elementary Chinese. (5) Students will receive no credit for 1A-1B after taking 1, 1X, or 1Y. Five hours of lecture per week. Prerequisites: A is prerequisite to B. These courses are designed for students who are of non-Chinese origin and were not raised in a Chinese-speaking environment; or who are of Chinese origin but do not speak any dialect of Chinese and whose parents do not speak any dialect of Chinese. This series of courses provides elementary training in listening, speaking, reading, and writing in Modern Standard Chinese. It enables students to function adequately in Chinese-speaking places or communities.

1X. Elementary Chinese for Mandarin Speakers. (4) Students will receive no credit for 1X after taking 1, 1A-1B, or 1Y. Four hours of lecture per week. Prerequisites: Consent of instructor. This course is designed specifically for heritage Chinese students who possess speaking skill but little or no reading and writing skills in Chinese. It introduces functional vocabulary and provides a systematic review of grammar, tonemes, and characters. It does not cover modern Mandarin Chinese. While there is training in listening, speaking, reading, and writing in Mandarin Chinese. While there is training in listening, speaking, reading, and writing, prominence is given to listening and speaking. This course will be taught in Mandarin Chinese.

1Y. Elementary Chinese for Dialiect Speakers. (5) Students will receive no credit for 1Y after taking 1, 1A-1B, or 1X. Five hours of lecture and one hour of tutorial per week. Prerequisites: Consent of instructor. This course is designed for students who have had exposure to a non-Mandarin Chinese dialect but possess little or no reading and writing skills in Chinese. Students will gain competence in reading and writing of Mandarin Chinese. While there is training in listening, speaking, reading, and writing, prominence is given to listening and speaking. This course will be taught in Mandarin.

7A. Introduction to Premodern Chinese Literature and Culture. (4) Students will receive no credit for 7A after taking 181A, but they can remove a deficient rating of "7A after taking 181A," and then register for 7B. (F) Staff
grade in 181A by taking 7A. Three hours of lecture and one hour of discussion per week. An introduction to Chinese literature in translation in a two-semester sequence. In addition to literary sources, a wide range of philosophical and historical texts will be covered, as well as aspects of visual and material culture. 7A covers early and premodern China up to and including the Yuan Dynasty (14th century); 7B will cover imperial, modern, and contemporary China. Course will focus on the development of sound writing skills for freshman/sophomore-level students. (F) Staff

7B. Introduction to Modern Chinese Literature and Culture. (4) Students will receive no credit for 7A after taking 35492 B. This can remove a deficiency upgrade in 181A by taking 7A. Three hours of lecture and one hour of discussion per week. An introduction to Chinese literature in translation in a two-semester sequence. In addition to literary sources, a wide range of philosophical and historical texts will be covered, as well as aspects of visual and material culture. 7A covers early and premodern China up to and including the Yuan Dynasty (14th century); 7B will cover imperial, modern, and contemporary China. Course will focus on the development of sound writing skills for freshman/sophomore-level students. (SP) Staff

10A-10B. Intermediate Chinese. (5,5) Students will receive no credit for 10A-10B after taking 10, 10X, or 10Y. Five hours of lecture per week. Prerequisites: 1X or consent of instructor. This course is designed to further improve students’ abilities in speaking, reading, listening, and writing Chinese for Mandarin Speakers or who have similar background. Mandarin Chinese by engaging in a variety of formal and informal communications. It trains students to use the language knowledge learned in class in real-life situations. Students will connect with the knowledge and information presented by the instructor, engage in discussions and, in written form, present their ideas to the class. For those who have taken Intermediate Chinese, this course will provide an opportunity to enhance skills in all aspects of Mandarin Chinese. This course is designed to further develop students’ Chinese language competence. More sophisticated structural patterns and advanced vocabulary will be addressed. In addition, students will be expected to make use of a variety of reference texts and other materials used in the study of Chinese Buddhist texts, and students will be expected to make use of a variety of reference tools in preparation for class. Readings in Chinese Buddhist literature will be supplemented by secondary reading materials. Readings in English on Mahayana doctrine and Chinese Buddhist history. Also listed as Group in Buddhist Studies C140.

Fifth-Year Chinese A. (4) Three hours of lecture per week. Prerequisites: 110B and consent of instructor. This course is designed to bring up the students to advanced-high competence in all aspects of modern Chinese; it aims to prepare students for research or employment in a variety of China-related fields. Materials are drawn from native-speaker target publications, including modern Chinese literature, film, intellectual history, and readings on contemporary issues. Radio and TV broadcasts will also be included among the teaching materials. Texts will be selected, in part, according to the students’ interests. With the instructor’s guidance, students will conduct their own research projects based on specialized readings in their own fields of study. The research projects will be presented both orally and in written form by the end of the semester. (F,SP) Staff

112. Ancient Chinese Prose. (4) Three hours of lecture per week. Prerequisites: 102 and consent of instructor. This course is designed to bring up the students to advanced-high competence in all aspects of modern Chinese; it aims to prepare students for research or employment in a variety of China-related fields. Materials are drawn from native-speaker target publications, including modern Chinese literature, film, intellectual history, and readings on contemporary issues. Radio and TV broadcasts will also be included among the teaching materials. Texts will be selected, in part, according to the students’ interests. With the instructor’s guidance, students will conduct their own research projects based on specialized readings in their own fields of study. The research projects will be presented both orally and in written form by the end of the semester. (F,SP) Staff

110. Ancient Chinese Prose. (4) Three hours of lecture per week. Prerequisites: 102 and consent of instructor. This course is designed to bring up the students to advanced-high competence in all aspects of modern Chinese; it aims to prepare students for research or employment in a variety of China-related fields. Materials are drawn from native-speaker target publications, including modern Chinese literature, film, intellectual history, and readings on contemporary issues. Radio and TV broadcasts will also be included among the teaching materials. Texts will be selected, in part, according to the students’ interests. With the instructor’s guidance, students will conduct their own research projects based on specialized readings in their own fields of study. The research projects will be presented both orally and in written form by the end of the semester. (F,SP) Staff

122. Ancient Chinese Poetry. (4) Three hours of lecture per week. Prerequisites: 110A. Readings from the Zhou, Han, and later periods from printed and manuscript sources. Readings in classical Chinese poetry such as essays, epigraphical materials, historical works, classical tales, administrative documents, scholars’ notes, geographical treatises, or travel diaries.

138. Readings in Chinese Drama. (4) Three hours of lecture per week. Prerequisites: 110B. Readings in Chinese Drama, readings at fourth-year level.

C140. Readings in Chinese Buddhist Texts. (4) Three hours of lecture per week. Prerequisites: Consent of instructor: Formerly Chinese 140. This course is an introduction to the study of medieval Buddhist literature written in classical Chinese. We will read samples from a variety of genres, including early Chinese translations of Sanskrit Buddhist scriptures, indigenous Chinese commentaries, philosophical treatises, and sectarian works, including Chan gongan (Zen koans). The course will also provide an introduction to the materials used in the study of Chinese Buddhist texts, and students will be expected to make use of a variety of reference tools in preparation for class. Readings in Chinese Buddhist literature will be supplemented by secondary readings in English on Mahayana doctrine and Chinese Buddhist history. Also listed as Group in Buddhist Studies C140.

B prefix=language course for business majors
C prefix=course satisfies R&Requirement
H prefix=honors course
R prefix=course satisfies S&Requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
157. Contemporary Chinese Literature. (4) Three hours of lecture per week. Prerequisites: 100A or 100XA (may be taken concurrently). This course explores popular, realist, and avant-garde literature from mainland China and Taiwan since 1949. We will consider how writers have engaged with the cultural dislocations of modernity; how exploring such questions as the presentation of cultural and gender identities and the politics of memory and place. Central to our discussion will be the problem of how literature not only reflects but also critically engages with historical and cultural experience through a variety of genres. A crucial aspect of this course will be the development of skills in close, critical, and historically contextualized reading.

158. Reading Chinese Cities. (4) Three hours of lecture per week. Prerequisites: 100A or 100XA (may be taken concurrently). Chinese cities are the sites of a number of complicated local/global interconnections as the nation is increasingly incorporated into the world system. University cities in particular are crucial in analyzing the dramatic transformation of Chinese society and culture. This course is designed to teach students to think about Chinese cities in more textured ways. How are urban forms and urban spaces produced through processes of social, political, and ideological conflict? How are cities represented in literary, cinematic, and popular cultures? How has our imagination of the city been shaped and how are these spatial discourses influencing the making of the city of tomorrow? (F,SP) Staff

159. Cities and the Country. (4) Three hours of lecture per week. Prerequisites: 100A or 100XA (may be taken concurrently). This course explores aspects of the most central and potent areas of cultural politics in modern China: the city and its relations to the countryside. We will explore how urban space and native soil became central places of imagination and desire in modern China; how Beijing and Shanghai become medi-cinal origins of the city been shaped and how are these cinematic, and various popular cultures? How has our imagination of the city been shaped and how are these spatial discourses influencing the making of the cities of tomorrow? (F,SP) Staff

161. Structure of the Chinese Language. (4) Three hours of lecture per week. Prerequisites: 100A or 100XA; Linguistics 5 or 100 recommended. Chinese dialects, Mandarin phonology, and Mandarin grammar.

165. History of the Chinese Language. (4) Three hours of lecture per week. Prerequisites: 100A or 100AX; Linguistics 5 or 100 recommended. Writing system, early dictionaries, historical phonology, and classical grammar.

182. Death and Funerary Practice in China. (4) Three hours of lecture per week. This course examines funerary practices in Chinese history, as a means of exploring the practices of ritual, funerary theory, and conceptions of the afterlife. We will consider the history of burial practice and tomb ornamentation, and the role of imperial tombs in the construction of author-183. Traditional Chinese Culture. (4) Three hours of lecture and one hour of discussion per week. This course will consist of lectures that provide a general overview of traditional Chinese culture from the early Zhou through the late medieval and early modern periods. We will consider the development of philosophy, art, religion, prose, and poetry. The subjects to be covered include the Chinese language and writing system, the Chinese classical canon, the development of Chinese art, philosophy, historiography, the philosophical and religious tradi-tions of Taoism, hero cults and ancestor worship, burial practice, the introduction of Buddhism and its role in early Chinese society, and the birth of Chinese fiction. (F,SP) Staff

C185. Introduction to Chinese Philosophy. (4) Three hours of lecture per week. Formerly Oriental Languages 167. A survey of the history of Chinese philosophy from late Chou times through the Ch’ing dynasty. Treated in some depth are a number of major Chinese thinkers including Confucius, Mencius, Hsun Tzu, Mo Tzu, Chuang Tzu, Tung Chung-shu, Chu Hsi, Wang Yang-ming, and Tai Chen. One of the major themes presented in the course is the development of Chinese ethical theory and the role of language in moral education. Also listed as Philosophy C167. (F,SP) Staff

186. Confucius and His Interpreters. (4) Three hours of lecture per week. This course examines the different spheres of meanings that Confucius and his immediate circle of followers have shaped goa through interpretations of the person and teachings of Confucius. We will consider how the words attributed to Confucius were understood by his near-contemporaries and by later generations, situating these readings within the social and political order of their times. We will examine how Confucian ideals have shaped government, social roles, and intellectual commitments, and how these influences have converged or competed in the formation of community and cultural standards. We will consider how Confucianism has been interpreted in China, and in the context of Chinese intellectual history, the role of language in moral education. Also listed as Philosophy C167. (F,SP) Staff

188. Popular Culture in 20th-Century China. (4) Three hours of lecture per week. This course is an introduction to media culture in 20th-century China, designed to introduce students to the rich and varied world of Chinese cinema, television, and various popular cultures. We will consider the role of imperial tombs in the construction of author-ship, and the politics of memory and place. Central to our discussion will be the problem of how literature not only reflects but also critically engages with historical and cultural experience through a variety of genres. A crucial aspect of this course will be the development of skills in close, critical, and historically contextualized reading.

189. Chinese Landscapes: Space, Place, and Travel. (4) Three hours of lecture per week. Prerequisites: One previous course in literature or cultural studies. What do landscapes say about the Chinese mind? How do landscape images reflect the Chinese fatherland and its land, nature, and other peoples? How do landscapes map one’s place in the world, shaping both cultural identities and real geographic spaces? Can landscapes travel? This course explores such questions by examining one of the world’s longest-running traditions of landscape representation. We will consider such landscape genres as poetry, prose description, fiction, travel narrative, maps, painting, and photography. We will consider how landscape of China’s long history of imperial expansion, colonization, and globalization. We will also consider China’s places in thinking about landscape and travel in the West. (F,SP) Schaefer

195A-H195B. Honors Course. (3-5,2-5) Hours to be arranged for credit and to be awarded based upon completion of sequence. Prerequisites: Senior honors standing in East Asian languages; 3.5 GPA in major, 3.3 overall. Directed independent study and preparation of a senior honors thesis. Limited to 5 candidates in East Asian Languages; (for description of Honors Program, see Index in this catalog).

198. Directed Group Study. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Junior standing. Small-group instruction in topics not covered by regularly scheduled courses. (F,SP) Staff

Graduate Courses

222. Early Chinese Thought. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: At least one year of classical Chinese. An analytical exploration of the central texts of Warring States (453-221 BCE) philosophy.

C223. Readings in Chinese Buddhist Texts. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. This seminar is an intensive introduction to various genres of Buddhist literature in classical Chinese, including translations of Sanskrit and Central Asian scriptures. Chinese commentaries, philosophical treatises, hagiographies, and sectarian works. It is intended for graduate students who already have some facility in classical Chinese. It will also serve as a tools and methods course, covering the basic reference works and secondary scholarship in the field of East Asian Buddhism. The content of the course will be adjusted from semester to semester to accommodate the needs and interests of students. Also listed as Group in Buddhist Studies C223. (F,SP) Staff

230. Seminar in Chinese Literary History. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Good reading knowledge of classical Chinese and consent of instructor. Previous coursework in classical Chi-nese literature is desirable. Readings in major genres and authors of Chinese literature, with attention to rele-vant "nonliterary" (philosophical, scholarly, historio-graphical, etc.) sources where useful; period and thematic focus varies from semester to semester.

234. Texts on the Civilization of Medieval China. (2,4) Three hours of seminar per week. Course content varies with interests of students.

242A-242B. Genre and Method in Traditional Chinese Literature. (2,4,2,4) Three hours per week. Prerequisites: 110B, and 100B or 100XB; 242A is prerequisite to 242B; consent of instructor. Introduction to the history of Chinese textual production. Detailed close reading of the texts and training in the methodology of solving problems of lexicon, theme, structure, imagery, and metaphor. (F,SP) Staff

245. Chinese Literatures and Cultures in Global Context. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. This course explores relations of Chinese literature and
culture to other parts of Asia, Africa, Latin America, or the West, ranging from specific global transactions to comparative perspectives, and ranging widely across different historical periods. Specific topics vary from year to year.

255. Late Imperial Fiction and Drama. (2,4) Three hours of seminar per week. This course examines the canonical texts of the late-imperial period, placing them in the context of literary culture of the Ming-Qing. The course is designed to focus on a different set of texts each time it is taught; the aim is to introduce students to the primary issues in scholarship of late-imperial fiction and drama over a period of several years.

256. Early 20th-Century Chinese Literature. (2,4) One hour of lecture per week. This seminar focuses on the discourse about the self in early 20th-century Chinese literature, including first-person fiction, autobiography, critical writings on subjectivity and modernity. (SP)

257. Modern Chinese Literature. (2,4) Three hours of seminar per week. Prerequisites: Reading knowledge of modern Chinese. Graduate seminar in modern Chinese literature. Topics vary from year to year. (F,SP)

280. Modern Chinese Cultural Studies. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar or lecture per week. Prerequisites: Reading knowledge of modern Chinese. Directed study of modern Chinese literary and media cultures. Course provides both historical coverage and a grounding in various debates and problems through theoretical and methodological approaches. Topics include print culture, cinema, popular music, and contemporary Chinese culture; emphasis varies from year to year.

298. Directed Study for Graduate Students. (1-8) Hours are arranged. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F,SP)

299. Thesis Preparation and Related Research. (1-8) Hours are arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of thesis supervisor and graduate adviser. (F,SP)

601. Individual Study for Master’s Students. (1-8) Hours are arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of graduate adviser. Individual study for the comprehensive or language requirements in consultation with the graduate adviser. Units may not be used to meet either unit or residence requirements for a master's degree. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Hours are arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for various examinations required of candidates for the Ph.D. (F,SP)

Japanese
Instructor approval is recommended for enrollment in language courses.

Courses numbered 170-189 are lecture courses given in English.

Lower Division Courses
1A-1B. Elementary Japanese. (5,5) Students will receive no credit for 1A-1B after taking 1. Five hours of lecture per week. Prerequisites: 1A is prerequisite to 1B. In the course, students will develop basic communication skills in Japanese and an understanding of Japanese society and culture. Students will learn vocabulary and grammar structures that will enable them to express themselves, their family and friends, the weather, and many other topics. Students will learn how to read and write in Japanese from the onsen, learning approximately 150 kanji (Chinese characters) by the end of each semester.

1AL-1BL. Supplementary Work in Listening—Elementary. (1,1) One hour of lecture per week. Must be taken on a passed/not passed basis. Designed to supplement the facility of students' listening proficiency. 1AL will cover a variety of listening strategies. 1BL is a continuation of 1AL where students will apply these strategies in listening activities. (F,SP) Staff

1AS-1BS. Supplementary Work in Kanji. (1,1) One hour of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: 1AS is prerequisite to 1BS. A course designed to be taken concurrently with 1A or 1B to help students improve overall kanji performance. The course will focus on the kanji learning: 1AS process by providing exercises and background information about the relationships between characters and how they function.

7A. Introduction to Pre-Modern Japanese Literature and Culture. (4) Students will receive no credit for 7A after taking 182A. Students can remove a deficien
century in 182A by taking 7A. Three hours of lecture and one hour of discussion per week. This course provides an overview of Japanese literature and cultural history, from the seventh to the 18th century. 7A will begin with Japan’s early-merchants, Kojiki, and its first extant poetic anthology, Man'yoshū, which show the first stages of transition from a preliterate, preliterate to an oral literate culture. The cultural and historical context of these early Japanese folktales. Readings from noblewomen’s diaries, poetry anthologies, and a selection of chapters from the classical Japanese literary masterpiece The Tale of Genji, offer the students an introduction to the development of the written word and the Japanese language. The course will provide a foundation for students in Japanese literature, history, and language. (F,SP) Staff

7B. Introduction to Modern Japanese Literature and Culture. (4) Students will receive no credit for 7B after taking 182B. Students can remove a deficien
century in 182B by taking 7B. Three hours of lecture and one hour of discussion per week. An introduction to Japanese literature in translation in a one-semester sequence. This course will provide a survey of important works of 19th- and 20th-century Japanese fiction, poetry, and cultural criticism. The course will cover the challenges of industrialization, modernization, and war. Topics include the shifting notions of tradition and modernity, the impact of Westernization on the construction of the self and gender, writers and the wartime state, literature of the atomic bomb, and post-modernity. Readings in English. Techniques of critical reading and writing will be introduced as an integral part of the course. (F,SP) Staff

10A-10B. Intermediate Japanese. (5,5) Students will receive no credit for 10A-10B after taking 10. Five hours of lecture per week. Prerequisites: 1B: 10A is prerequisite to 10B. In this course, students will learn how to integrate the basic structures and vocabulary that they acquired in their first year, so they can communic
cultural context. Students will study new structures and vocabulary needed to enhance their communicative abilities. While additional skills are continuously emphasized, an increased amount of reading and writing will also be required. Each course will introduce approximately 150 new kanji.

10AG-10BG. Supplementary Work in Grammar—Intermediate. (1,1) One hour of lecture per week. Must be taken concurrently with 10A. Students enrolled in supplementary courses are designed for students who are concurrently enrolled in 10A and 10B to enable their acquisition of a better understanding of Japanese grammar in general and clause linkage in particular. (F,SP) Staff

10A5-10B5. Supplementary Work in Kanji—Intermediate. (1,1) One hour of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: 10A5 is prerequisite to 10B5. These supplementary courses are designed for students who are concurrently enrolled in 10A and 10B to acquire a better understanding of kanji writing system and to improve overall kanji proficiency. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit. One hour of seminar per week for 15 weeks. Topics are offered in all campus departments, and topics vary from semester to semester. (F,SP)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sopho
mores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars cover a variety of topics and are open to students from department to department from semester to semester.

98. Directed Group Study for Lower Division Stu
dents. (1-4) Enrollement is restricted; see the Intro
duction to Courses and Curricula section of this catalog. One hour per week. Students may be taken on a passed/not passed basis. Prerequisites: Lower division standing; 3.5 GPA. Small group instruction in topics not covered by regularly scheduled courses. (F,SP)

99. Independent Study for Lower Division Stu
dents. (1-4) One hour of lecture per week. See the Intro
duction to Courses and Curricula section of this catalog. Hours are arranged. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing; 3.5 GPA. Independent study in topics not covered by regularly scheduled courses.

Upper Division Courses
100A-100B. Advanced Japanese. (5,5) Students will receive no credit for 100A-100B after taking 100. Five hours of lecture per week. Prerequisites: 10B: 100A is prerequisite to 100B. This course aims to develop further conversational skills in speaking, listening, reading, and writing. It concentrates on enabling students to use acquired grammar and vocabulary with more confidence. Course materials include the textbook, and various Japanese newspapers, magazines, and short stories to provide insight into Japanese cul
ture and society.

100S. Japanese for Sinologists. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Graduate standing; 10B and Chinese 100B or equivalents. Students will be trained to read, analyze, and translate modern Japanese scholarship on Chinese subjects. A major purpose of the course is to prepare students to take reading examinations in the various areas of scholarship covered in Japanese language, politics, popular culture and religion, sociology and history as well as areas suggested by students who are actively engaged in research projects. Two readings in each area will be assigned; one by the instructor and the second by a student participant.

101. Fourth-Year Readings: Social Sciences. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100B or consent of instructor. This course provides further develop
cultural context. Students will study new structures and vocabulary needed to enhance their communicative abilities. While additional skills are continuously emphasized, an increased amount of reading and writing will also be required. Each course will introduce approximately 150 new kanji.

10AG-10BG. Supplementary Work in Grammar—Intermediate. (1,1) One hour of lecture per week. Must be taken concurrently with 10A. Students enrolled in supplementary courses are designed for students who are concurrently enrolled in 10A and 10B to enable their acquisition of a better understanding of Japanese grammar in general and clause linkage in particular. (F,SP) Staff

W prefix=onlinetext course *Professor of the University School †Recipient of Distinguished Teaching Award

Prefix language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R & C requirement
AC suffix=course satisfies American Cultures requirement

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102. Fourth-Year Readings: Japanese Culture. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100B or consent of instructor. This course provides further development of reading, writing, speaking, and listening skills to enable students to express their points of view and construct argumentative discourse. Students read a variety of Japanese literary and historical sources to enable their understanding of Japanese society and people.

103. Fourth-Year Readings: Japanese Literature. (4) Three hours of lecture per week. Prerequisites: 100B or consent of instructor. This course provides further development of reading, writing, speaking, and listening skills to enable students to express their points of view and construct argumentative discourse.

104. Fourth-Year Readings: Japanese History. (4) Three hours of lecture per week. Prerequisites: 100B or consent of instructor. This course provides further development of reading, writing, speaking, and listening skills to enable students to express their points of view and construct argumentative discourse. In addition to Japanese literature, readings include newspaper articles and other texts as sources of discussion. Students read a variety of writing styles and learn more aspects of Japanese society. (F) Staff

111. Fifth-Year Japanese A. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 102 or equivalent; basic knowledge of—and reading skills related to—the Internet. This course is designed for students who have studied Japanese for at least four years (540 hours). It aims to develop further their reading, writing, speaking, and listening skills with special emphasis on essay and research paper writing on topics relevant to the student’s major or intended career. Part of this written work will involve the material on which the student will give an end-of-term oral examination. Students are expected to fully prepare for and dynamically participate in the discussions and debates that occur in class.

C115. Japanese Buddhism. (4) Three hours of lecture per week. Formerly Buddhism 115. A critical survey of the main themes in the history of Japanese Buddhism as they are treated in modern scholarship. The course covers the transmission of Buddhism from China and Korea to Japan; the subsequent expatriation of Japanese Buddhism; and the subsequent influence of Buddhism in Japan. The course is divided into two parts: the period from the introduction of Buddhism in Japan through the Heian period, with special emphasis on the Zen and Shingon schools; and the later periods, with a focus on the evolution of Buddhist thought and practice. Students are introduced to the major figures, texts, and institutions of Japanese Buddhism, and are encouraged to think critically about the relationship between Buddhist thought and Japanese culture.

C130. Classical Japanese Poetry. (4) Three hours of lecture per week. Prerequisites: 120. An introduction to the critical analysis and translation of traditional Japanese poetry, a genre that reaches from early-declarative work redolent of an even earlier oral tradition to medieval and early modern verses evoking exquisitely differentiated emotional states via complex rhetoric and literary allusion. Topics may include the poetry of Man'yoshu, Kokinshu, and Shin Kokinshu; poetic anthologies, linked verse (renga), and the haiku of Basho and other early modern poets.

C132. Pre-Modern Japanese Diary (Nikki) Literature. (4) Three hours of lecture per week. Prerequisites: 120. The course focuses on the diary literature of early modern Japan, including Murasaki Shikibu’s The Tale of Genji and Sei Shonagon’s Pillow Book.

C142. Japanese Medieval Prose. (4) Three hours of lecture per week. Prerequisites: 120. This course examines the development of Japanese literature from the Heian period to theEdo period, focusing on the uses of poetry, prose, and drama.

C144. Edo Literature. (4) Three hours of lecture per week. Prerequisites: 120. Critical reading and translation of important literary texts from the Edo period, including poetry, diaries, and literary works.

C146. Japanese Historical Documents. (4) Three hours of lecture per week. Prerequisites: 120. This course focuses on the form and evolution of Japanese historical documents from the Heian period to the modern era.

C152. Modern Japanese Literature. (4) Three hours of lecture per week. Prerequisites: 120. This course surveys modern Japanese literature, focusing on the development of the post-war period.

C155. Modern Japanese Literature. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 100B (may be taken concurrently). This course surveys modern Japanese literature, focusing on the development of the post-war period.

C156. Classical Japanese Literature in Translation. (4) Three hours of lecture per week. Prerequisites: 120. This course surveys Japanese poetry and prose written predominantly in or before the Heian Period (794-1185). Students are required to have advanced knowledge of Japanese. No previous linguistics training is required. (F.SP) Hasegawa

163. Translation: Theory and Practice. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. An overview of the concepts of theoretical, contextual, and practical linguistics used for work in translation between Japanese and English through experience. Topics include analysis of the text, process of translating, faithfulness to the text.

170. Classical Japanese Literature in Translation. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. This course surveys Japanese poetry and prose written predominantly in or before the Heian Period (794-1185). Topics will vary. (F.SP) Staff

172. Tokyo: Biography of a City. (4) Three hours of lecture per week. In this course, we will revisit the four hundred year history of Tokyo, one of the greatest cities to rise in Asia and the world. Using a variety of sources that include literature, art, and film, we will begin with the creation of Edo (Tokyo’s former name) as the castle town of Japan’s ruling military family and trace the centuries-long changes brought to the city by evolving samurai ethics, culture, commerce, industry, modernization, and globalization. (F.SP) Staff

C174. Japanese Buddhism in Diaspora. (4) Three hours of lecture per week. Pre-requisite: C125B. This course will offer a survey of Buddhist Studies or consent of instructor. This course focuses on Japanese Buddhism during the late 19th and early 20th centuries in its contact with modernity, colonialism, and migration history. Looking at the Japanese Diaspora around the Pacific Rim, we will begin with Japanese Buddhism’s relationship with the Meiji state, State Shinto, Christianity, and the West. Regions covered include Manchuria, Korea, Hawaii, the United States, Canada, and Brazil. Also listed as Group in Buddhist Studies C174. (F.SP) Williams

C175. Archaeology of East Asia. (4) Three hours of lecture per week. Prehistoric and protohistoric archaeology in China, Japan, and Korea. Also listed as Anthropology C125A. (F.SP) Staff

C176. Archaeology and Japanese Identities. (4) Three hours of lecture per week. Prehistoric and protohistoric archaeology in China, Japan, and Korea. Also listed as Anthropology C125A. (F.SP) Staff

180. Ghosts and the Modern Literary Imagination. (4) Three hours of lecture per week. Explores the supernatural in shibai, graphic novels, and film. Topics include the transformation of modern Japan (18th century to present), the horror genre, and its conversion into aesthetic pleasure, fantasy, and the transformation of the commonplace. We will consider historical, visual, anthropological, and literary approaches to the supernatural and raise cultural and philosophical questions crucial to our understanding of the Japanese past and present. (F) Staff

185. Introduction to Japanese Cinema. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. This course surveys the history of Japanese cinema from its earliest days to contemporary animation. Providing the basic tools for analyzing film language, the course begins by analyzing the interaction between early Japanese film and early Hollywood. We then consider the development of Japanese cinema, discussing style and structures of connotation, figural meaning and political critique, the uses of the historical past and ideology,
and the roles of youth culture and views of the family. We consider the (sometimes anomalous) place of important individual directors, with a special emphasis on the use of narrative, personal, and experimental film. We also discuss current critical debates about broader trends in Japanese film and culture, as they illuminate the construction and ruptures in notions of Japanese identity.

188. Japanese Visual Culture: Introduction to Animation. (3) Three hours of lecture and two hours of film viewing/discussion per week. This course is an introduction to Japanese animation, or anime, from its earliest forms (in relationship to manga) to recent digital art. Anime games. We will analyze and study mainly animated feature films and read the critical work they inspired. We will address such issues as cultural memory and apocalyptic imagination; robots and the post-human; cities, nature, and the transnational; gender, shojö, and the aesthetics of "cute," as well as consider specific issues in the theoretical understanding of anime within technology and media theory. (F,SP) O'Naill

H195A-H195B. Honors Course. (2-5,2-5) Hours to be arranged. Credit and grade to be awarded on completion of sequence. Prerequisites: Senior honors standing in East Asian languages; 3.5 GPA in major, 3.3 overall. Directed independent study and preparation of thesis. Limited to senior honors candidates in East Asian languages for description of Honors Program, see the Index in this catalog. (F,SP)

198. Directed Group Study. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a pass/not pass basis. Prerequisites: Junior standing. Independent study in topics not covered by regularly scheduled courses. (F,SP)

Graduate Courses

C225. Readings in Japanese Buddhist Texts. (2,4) Course may be repeated for credit. Three hours of seminar per week. This seminar is designed to serve as an introduction to and overview of the classical Buddhist corpus. Topics include (1) liturgical texts; (2) monastic traditions; (3) classical Japanese. The seminar will also serve as an opportunity for qualified students to prepare for the Ph.D. (F,SP) Staff

230. Seminar in Classical Japanese Poetry, (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Two semesters of classical Japanese. Topics run from Japan's earliest extant anthology of vernacular literature (Man'yōshū) to late-medieval linked-verse (renga) and haiku.

232. Japanese Bibliography. (2,4) Three hours of seminar per week. Prerequisites: Reading ability in modern Japanese; classical Japanese helpful but not required. An introduction to research tools for Japanesefield. Includes primary sources, secondary literature and to literary sources but also presents an overview of basic texts and websites dealing with bibliographical citation, lexicography, history, religion, fine arts, geography, personal names, biographies, genealogies, and calendrical calculation. Internet access is required.

240. Seminar in Classical Japanese Texts. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Two semesters of classical Japanese. Topics may include The Tale of Genji or other prose works in the classical corpus.

242. Seminar in Medieval Japanese Texts. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Two semesters of classical Japanese. This seminar examines several types of pre-modern Japanese drama along with narrative texts to explore the limits of significance of genre distinctions.

255. Seminar in Prewar Japanese Literature. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Gradate standing and consent of instructor. Reading and critical evaluation of selected texts in pre-war (roughly the 1860s though the 1940s) Japanese literature and literary and cultural criticism. Texts change with each offering of the course.

259. Seminar in Postwar Japanese Literature. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Graduate standing and permission of instructor. Reading and critical evaluation of selected texts in post-war (roughly the 1940s through the present) Japanese literature and cultural criticism. Texts change with each offering of the course.

288. Directed Study for Graduate Students. (1-8) Hours to be arranged. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F,SP)

601. Individual Study for Master's Students. (1,8) Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of thesis supervisor and graduate adviser. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for various examinations required of candidates for the Ph.D. (F,SP)

Korean

Instructor approval is recommended for enrollment in language courses.

Courses numbered 180-189 are lecture courses given in English.

Lower Division Courses

1A-1B. Elementary Korean. (5,5) Five hours of lecture per week. Prerequisites: 1A is prerequisite to 1B; or consent of instructor. These courses are designed for students who have little or no prior knowledge of the Korean language. With emphasis on speaking, reading, writing, and reading skills, the course will introduce the basic grammar of the Korean language. The courses are also intended to introduce certain cultural aspects through media sources and various activities. (F,SP) 1AX-1BX. Elementary Korean for Heritage Speakers. (5,5) Students will receive no credit for 1A or 1B after taking 1A or 1A-1B. Five hours of lecture per week. Prerequisites: 1AX is prerequisite to 1BX; or consent of instructor. These courses are designed for students who already have elementary comprehension and speaking skills in Korean and have minimum exposure to reading and/or writing in Korean. (F,SP) Staff

7A. Introduction to Pre-Modern Korean Literature and Culture. (4) Students must have credit for 7A after taking 7A. Students can remove a deficient grade in 187A by taking 7A. Three hours of lecture per week. A survey of pre-modern Korean literature and culture from the seventh century through the 19th century, focusing on the relation between literary texts and various aspects of performance tradition. Topics include literary culture, gender relations, humor, and social commentary. Texts include ritual songs, sijo, kansu, prose narratives, art, and contemporary media representation of performance traditions. All readings are in English. (F) Staff

7B. Introduction to Modern Korean Literature and Culture. (4) Students will receive no credit for 7B after taking 7B. Students can remove a deficient grade in 187B by taking 7B. Three hours of lecture per week. A survey of modern Korean literature and culture in the 20th century, focusing on the development of nationalist aesthetics in both North and South Korea. Topics include "new woman" narratives, urban culture, colonial modernity, war and trauma, and diaspora. Texts to be examined include works of fiction, poetry, art, and cultural aspects of the language. (F) Staff

10A-10B. Intermediate Korean. (5,5) Five hours of lecture per week. Prerequisites: 10A is prerequisite to 10B; or consent of instructor. This is a second-year course in modern Korean with equal attention given to listening, speaking, reading, writing, and cultural immersion. (F,SP) Staff

10AX-10BX. Intermediate Korean for Heritage Speakers. (5,5) Students will receive no credit for 10AX-10BX after taking 10A or 10B. Five hours of lecture per week. Prerequisites: 10AX is prerequisite to 10BX. Intermediate Korean for Heritage Speakers. Korean proficiency level is higher in speaking than in reading or writing due to Korean-heritage background. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

99. Independent Study for Lower Division Students. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a pass/not pass basis. Prerequisites: Lower division standing; 3.5 GPA. Small-group instruction in topics not covered by regularly scheduled courses. (F,SP) Staff

Independent Study for Lower Division Students. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a pass/not pass basis. Prerequisites: Lower division standing; 3.5 GPA. Independent study in topics not covered by regularly scheduled courses. (F,SP) Staff

Upper Division Courses

100A-100B. Advanced Korean. (4,4) Three hours of lecture per week. Prerequisites: 100A is prerequisite to 100B; or consent of instructor. This is a third-year course in modern Korean with emphasis on grammar, vocabulary, and grammatical structure. Approximately 100 Sino-Korean characters will be introduced in each semester. Students will gain exposure and knowledge of advanced-level Korean by reading authentic materials, writing short compositions, summaries, essays, and critical reviews. Small-group discussions will enhance speaking skills. (F,SP) Staff

100AX-100BX. Advanced Korean for Heritage Speakers. (4,4) Three hours of lecture per week. Pre-
101. Fourth-Year Readings—Literature. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100B. An advanced course in the reading and analysis of literary texts in modern Korean. Advanced conversation, writing skills, and practice in the use of standard reference tools will also be emphasized, with the goal of preparing students to do independent research in Korean.

102. Fourth-Year Readings—Social Sciences and History. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100B. An advanced course in the reading and analysis of specialized texts in modern Korean drawn from history, sociology, economics, etc. Advanced conversation, writing skills, and practice in the use of standard reference tools will also be emphasized, with the goal of preparing students to do independent research in Korean.

111. Fifth-Year Korean A. (4) Three hours of lecture per week. Prerequisites: 102. This course is designed to increase the students’ proficiency to advanced-high level in all aspects of modern Korean; it aims to prepare students for research or employment in a variety of Korea-related fields. Text materials are drawn from authentic sources including modern Korean literature, film, intellectual history, and readings on contemporary issues. Radio and TV broadcasts will also be included in the teaching materials. Texts will be selected, in part, according to student interests. With the instructor’s guidance, students will conduct research projects based on specialized readings in their own fields of study. The research projects will be presented both orally and in written form at the end of the semester. (F,SP) Staff

112. Fifth-Year Korean B. (4) Three hours of lecture per week. Prerequisites: 102. This course is designed to increase the students’ proficiency to advanced-high level in all aspects of modern Korean; it aims to prepare students for research or employment in a variety of Korea-related fields. Text materials are drawn from authentic sources including modern Korean literature, film, intellectual history, and readings on contemporary issues. Radio and TV broadcasts will also be included in the teaching materials. Texts will be selected, in part, according to student interests. With the instructor’s guidance, students will conduct research projects based on specialized readings in their own fields of study. The research projects will be presented both orally and in written form at the end of the semester. (F,SP) Staff

130. Genre and Occasion in Traditional Poetry. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 100B or equivalent. This course will examine traditional hyangga, sijo, kasa, hansi, and akchang poetry, and consider the performative and cultural contexts of compositional practice before the 20th century. The course is intended to introduce key verse forms as well as basic reading knowledge of pre-modern Korean texts. Topics will vary. (F,SP) Shin

140. Narrating Persons and Objects in Traditional Korean Prose. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. This course is a critical exploration of the broad range of prose literature before the 20th century, including vernacular fiction, memoirs, travel accounts, and essays. Particular attention will be given to narrative fiction, personal experiences, and self-identity of the author, and the development of characters in the novels and short stories of the 20th century. The course is intended to introduce key narrative forms, while functioning simultaneously as an introduction to a basic reading knowledge of pre-modern Korean texts. Topics will vary. (F,SP) Shin

150. Modern Korean Poetry. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 100B or equivalent. This course will examine the works of major poets in the first half of the 20th century and will consider the formation of modern Korean poetry. Particular attention will be given to the ideas of lyricism, modernism, and the identity of a poet in the context of the colonial occupation of Korea. (F,SP) Shin

155. Modern Korean Fiction. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 100B or equivalent. This course surveys modern Korean fiction in the first half of the 20th century. Readings include major works of the novel, short fiction, and literary criticism. The course examines the development of modern fiction in the context of nationalist movements, colonialism, and the Korean War. (F,SP) Shin

157. Contemporary Korean Literature. (4) Three hours of lecture per week. Prerequisites: 100B or equivalent. This course surveys contemporary Korean literature, focusing on the separate development of language, literary aesthetics, and nationalism in North and South Korea from the end of the Korean War to the present. The course examines an assortment of works of fiction, poetry, literary criticism, and visual media. Emphasis is on close readings of the texts, while considering various issues involving post-colonial cultural production: war and trauma, gender and labor, political violence and presentation, modernization and dissolution, and diaspora. Topics will vary. (F,SP) Shin

163. Translation: Theory and Practice. (4) Three hours of lecture per week. Prerequisites: 100B or equivalent. This course will provide an overview of the considerations that a translator must take into account when approaching a Korean text. Special attention will be paid to the historical and linguistic differences between Korean and English as well as cross-cultural differences in stylistics. Texts to be considered are drawn from both expository and literary writings in Korean. By means of translating selected texts in English, students will acquire abilities to recognize common translating problems, explore methods for finding solutions, and evaluate accuracy and communicative effectiveness of translation. (F,SP) Staff

180. Critical Approaches to Modern Korean Literature. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: One upper division literature course. This course introduces various critical approaches to modern Korean literature through a set of texts in English translation. Readings will include an assortment of works of fiction, poetry, literary criticism, and visual media. Emphasis is on close reading of texts and literary approaches to them. (F,SP) Shin

185. Picturing Korea. (4) Three hours of lecture per week. This course will examine the modern visual and media shaping geopolitical, cultural, and historical imaginations of Korea during the last hundred years. Drawing examples from photographs, films, and literature, the course aims to explore the visual, visual culture in Korea. We will think in particular about the ways in which globally accessible visual media such as photography and film narrate the collective sites of contested memories of colonization, war, and political violence. (F,SP) Shin

195A-H195B. Honors Course. (2-5,2-5) Hours to be arranged in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for various examinations required of candidates for the Ph.D. (F,SP) Staff

200. Special Topics in Korean Literature for Graduate Students. (2,4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing and consent of instructor. This seminar provides in-depth discussions on a topic germane to Korean and other East Asian literary and cultural studies. Students in the Group in Asian Studies and the Korean Program are particularly recommended to take this course. Students in Chinese and Japanese may take this course for the purpose of comparative examination with the student's main area of research. The course is open to graduate students in all fields, but students should consult with the instructor to determine the viability of this course for the student's overall program of studies. Topics will vary. (F,SP) Shin

298. Directed Study for Graduate Students. (1-8) Hours to be arranged. Special tutorial or seminar on selected topics not covered by available courses or seminars. (F,SP)

299. Thesis Preparation and Related Research. (1-8) Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of thesis supervisor and graduate adviser. (F,SP) Staff

601. Individual Study for Master's Students. (1-8) Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of graduate adviser. Individual study for the comprehensive or language requirement in consultation with the graduate adviser. Units may not be used to meet either unit or residence requirements for a master's degree. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare for various examinations required of candidates for the Ph.D. (F,SP) Staff

Tibetan

Lower Division Courses

1A-1B. Elementary Tibetan. (5;5) Five hours of lecture and additional time in the language laboratory per week. Prerequisites: 1A is prerequisite to 1B. A beginning Tibetan class developing listening, speaking, reading, and writing skills in modern Tibetan (Lhasa dialect). (F,SP) Staff

10A-10B. Intermediate Tibetan. (3;3) Three hours of lecture per week. Prerequisites: 1B; 10A is prerequisite to 10B. This course, a continuation of 1A-1B (elementary Tibetan), is designed to further develop the student's skills in modern standard Tibetan. The emphasis is on communication skills in vernacular Tibetan as well as grammar, reading, and writing. (F,SP) Staff

Upper Division Courses

110A-110B. Intensive Readings in Tibetan. (4;4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 1B or consent of instructor. This course is an intensive introduction to reading classical Tibetan literature. Following an introduction to basic grammar, the course moves quickly into selected readings from Buddhist texts in Tibetan. It typically builds on basic skills acquired in 1A-1B (elementary Tibetan), though with consent it may be taken independently. (F,SP) Staff

C114. Tibetan Buddhism. (4) Three hours of lecture per week. This course is a broad introduction to the...
Economics

(From Letters and Science)

Department Office: 508-1 Evans Hall, (510) 642-0822
Chair: Gérard Roland, Ph.D.

Professors

Robert M. Anderson (Professor of Mathematics and Economics; Director, Center for Mathematical Economics)
Alan Auerbach (The Robert D. Burch Professor of Economics and Law), Ph.D. Harvard University, Public finance, health
Prabhu Baliga (Ph.D. Massachusetts Institute of Technology), Development economics
David Card (The Class of 1950 Professor of Economics), Ph.D. Princeton University, Labor economics, job matching
Jan de Vries (The Sidney Hellman Ehren Professor of History, History of Science, markets, history, environment and urbanization)
J. Bradford DeLong, Ph.D. Harvard University, Economic theory, macroeconomics, economic growth, finance
Aaro Einil (The Richard Jennings Endowed Chair Professor of Economics, Professor of Law), Ph.D. Stanford University, Industrial organization, law and economics
Barry Eichengreen (The George C. Paarde and Helen N. Paarde Professor of Economics and Political Science), Ph.D. Yale University, Economic history, international economics
Joseph V. Farrell, Ph.D. Oxford University, Microeconomics, finance, industrial organization
Pierre-Olivier Gourinchas (Ph.D. Massachusetts Institute of Technology), Macroeconomics, international macroeconomics, finance
Benjamin E. Hermalin (The Class of 1950 Professor of Economics and Law), Ph.D. Columbia University, Law, economics, finance
Shachar Kariv, Ph.D. New York University, Economic theory, experimental and behavioral economics
Michael Katz (The Sarah and David G. Rosechair in Leadership and Professor of Economics), Ph.D. Oxford University, Industrial organization
Botoliv Koszegi, Ph.D. Massachusetts Institute of Technology, Behavioral economics, public finance
Ronald D. Lee (The Edward G. and Nancy S. Jordan Professor of Economics; Professor of Demography; Director, Gender, Economics and Demography of Aging), Ph.D. Harvard University, Demography
Justin McCrary (The Class of 1950 Professor of Economics of California, Berkeley, Labor economics
Edward Miguel, Ph.D. Harvard University, Development economics
Enrico Moretti (The Michael and Donald Yai Chair in Labor Economics), Ph.D. University of California, Berkeley, Labor economics, urban economics
John Morgan, Ph.D. Pennsylvania State University, Theory, industrial organization
Maurice Obstfeld (The Class of 1958 Professor of Economics; Director of the Center for International and Development Economics), Ph.D. Massachusetts Institute of Technology, International economics, macroeconomics, monetary economics
James L. Powell, Ph.D. and George Breske Professor of Economics), Ph.D. Stanford University, Econometrics
John M. Quigley (The I. Donald Terner Distinguished Professor of Economics and Law), Ph.D. Harvard University, Public economics, public policy, urban economics
Matthew Rab (The Edward G. and Nancy S. Jordan Professor of Economics), Ph.D. Massachusetts Institute of Technology, macroeconomics, game theory
Michael Rees (Reesearch Director, Institute for Labor and Employment), Ph.D. Harvard University, Political economies, labor
Gérard Roland (Department Chair), Ph.D. Université Libre de Bruxelles (ULB), Political, comparative, and institutional economics
Christina D. Romer (The Class of 1897 Gaff B. Wilson Professor of Economics), Ph.D. Massachusetts Institute of Technology, Economics
David H. Romer (The Herman Royer Professor of Political Economy), Ph.D. Harvard University, History of Technology, Macroeconomics, monetary economics
Daron Rubinfeld (The Robert L. Bridges Professor of Law; Professor of Economics), Ph.D. Massachusetts Institute of Technology, Public economics, law and economics, antitrust policy
Emmanuel Saez (The E. Morris Fox Professor of Economics; Director, Center for Equitable Growth), Ph.D. Massachusetts Institute of Technology, Public economics
Suzanne Scott (Professor of Economics, Law, and Public Policy), Ph.D. California Institute of Technology, Family Economics, Labor Economics, industrial organization, law and economics, public policy
Chrisina Shannon (The Richard and Lisa Steiny Professor of Economics and Mathematics), Ph.D. Harvard University, Economic theory, mathematical economics
Car B. Shapiro (The Transamerica Professor of Business Strategy), Ph.D. Massachusetts Institute of Technology, Industrial organization
Laura D. Tyson (The Class of 1939 Professor of Economics and Business Administration), Ph.D. Massachusetts Institute of Technology, Comparative economic systems, environmental economics, economic development and planning, international trade, economics
Irina Adelman (Emerita), Ph.D.
*George A. Akerlof (Emeritus), Ph.D.
*P. Cox Brown (Emeritus), Ph.D.
*Roger Craine (Emeritus), Ph.D.
*Albert Fishlow (Emeritus), Ph.D.
*Richard J. Gilbert (Emeritus), Ph.D.
Steven M. Goldman (Emeritus), Ph.D.
*Gregory Grossman (Emeritus), Ph.D.
*Bronwyn H. Hall (Emerita), Ph.D.
Theodore E. Kester (Emeritus), Ph.D.
John M. Lethie (Emeritus), Ph.D.
*Gerald L. MacDonald (Emeritus), Ph.D.
*F. Thomas (2000) (Emeritus), Ph.D.
*J. Thomas (2000) (Emeritus), Ph.D.
*Hal Varian (Emeritus), Ph.D.
*Lindley (Emeritus), Ph.D.
*D. L. Ward (Emeritus), Ph.D.
*Oliver Williamson (Nobel Laureate 2009), Ph.D.
*Janet Yellen (Emeritus), Ph.D.
Associate Professors

†Stefano DellaVigna, Ph.D. Harvard University, Behavioral economics, applied microeconomics
Michael Janson, Ph.D. Aarhus University. Econometrics
Ulrike Malmendier, Ph.D. Harvard University. Corporate finance, behavioral finance
Aitf Mian, Ph.D. Massachusetts Institute of Technology. Finance, macroeconomics, development economics, political economy
Jesse Rothstein, Ph.D. University of California, Berkeley. Labor econometrics, public finance
Adam Szefid, Ph.D. Harvard University. Economic theory, finance
Assistant Professors

David S. Ahn, Ph.D. Stanford University. Economic theory, mathematical economics
Frederik Finan, Ph.D. University of California, Berkeley. Development economics, political economy
Yury Gorodnichenko (Emeritus), Ph.D. Harvard University. Macroeconomics, economometrics, international economics, labor economics
Bryan S. Graham, Ph.D. Harvard University. Econometrics, labor, revenue
Patrick Kline, Ph.D. University of Michigan. Labor economics, urban economics, applied econometrics
Dennis Knezkev, Ph.D. Duke University. Econometrics, empirical industrial organization
Domenico Pozzolo, Ph.D. New York University. Econometrics, macroeconomics
Adjunct Professors

†Martha L. Olney, Ph.D. University of California, Berkeley. Economic history, macroeconomics, discrimination
*David S. Riebschleger, Ph.D. University of California, Berkeley. Comparative, development, and international economics
Keith C. Tran, Ph.D. University of California, Berkeley. Applied econometrics, regulation
Glenn A. Woroch, Ph.D. University of California, Berkeley. Industrial organization, regulation, telecommunications economics

Department Overview

Founded in 1903, our department is well-known for the excellence of its teaching and advising, with a strong reputation for producing outstanding Ph.D. graduates as well as rigorous and innovative economics research. In recent years, UC Berkeley economics Ph.D.s have been hired at many other leading institutions, including Harvard, MIT, Yale, the U.S. Federal Reserve, and the World Bank. We are consistently ranked among the world’s top research departments. Berkeley faculty have won five Nobel Prizes, five John Bates Clark Medals, and 21 Alfred P. Sloan Research Fellowships (Graduate School since 1995). Berkeley economics faculty and students have done groundbreaking work in economic theory, econometrics, macroeconomics, and all major fields of applied research, and have served as policymakers at the highest levels, both in the United States and abroad.

Admission to the Major

As an impacted major with a highly competitive admissions process, the economics major is capped. Students who want to apply to the economics major must have completed or be currently enrolled in all the major prerequisites. After fall 2004, students admitted to UC Berkeley as freshmen must apply by their fifth semester of post-high school coursework unless they have fewer than 80 total units of coursework in progress but excludes high school enrichment units, e.g. Advanced Placement, International Baccalaureate, or college units earned prior to
high school graduation. Transfer students admitted to UC Berkeley fall 2006 and later are required to enroll in missing prerequisites and apply to the major during their first semester at Berkeley. The unit cap does not apply to transfer students.

For more information, visit our website at econ.berkeley.edu/econ/ugrad/ugrad.shtml.

Undergraduate Major Program
Prerequisites. One year of calculus (Mathematics 1A-1B or Mathematics 16A-16B) and one semester of statistics: either Statistics 20, 21, 25, 101, 102, 131A, or 134 (the statistics course must have a calculus prerequisite); Economics 1 or 2; and Economics 10A, 100B, 101A, or 101B. At least one semester of the calculus/statistics requirement must be completed at Berkeley.

Major Requirements. Economics 100A and 100B, or 101A and 101B; Econometrics (either Economics 140 or 141); and five upper division economics courses. All courses must be taken on a letter-graded basis.

Advising. All majors are encouraged to consult with faculty advisers and the undergraduate adviser frequently in planning their programs. Students planning to do graduate work in economics are urged to take more quantitative courses in economics.

Departmental Honors
Students interested in graduating with honors in economics should consult with a faculty adviser no later than their first semester of the senior year. The department recommends a student for graduation with honors based on: (1) evidence of superior performance provided by a thesis written in the senior year, and (2) the student’s course grade record overall and in the major. The minimum major GPA requirement is 3.5 in upper-division economics courses with a cumulative GPA of 3.3. GPA is calculated overall. The senior thesis may be an extension of a seminar paper prepared under the continued guidance of a faculty member through enrollment in H195A/B.

Graduate Program
The graduate program trains doctoral students interested in pursuing advanced study and conducting original research in economics. A strong mathematical background is a must. Detailed information concerning admission, financial aid, and degree requirements may be obtained from the department website at emlab.berkeley.edu/econ/grad/grad.shtml.

New admissions to the graduate program are restricted to students pursuing the Ph.D. degree. There is no external, terminal program for the M.A. degree; only students enrolled at Berkeley or in other doctoral programs at Berkeley may enroll for an M.A. degree in economics if approval is given by both departments.

Other requirements for the internal M.A. degree are as follows: (1) coursework in economic theory equivalent to Economics 101A-101B, 200A-200B, or 101A, 202A; (2) completion of 24 units of approved coursework, of which 12 units must be in graduate economics courses numbered 201 or greater; and (3) satisfactory performance in two written field examinations. Interested students should contact the graduate adviser for further details and an application at gradofc@econ.berkeley.edu.

Law and Economics
Berkeley Law and the Department of Economics sponsor a concurrent program which permits students to study for the degree of Juris Doctor while preparing for the Ph.D. in economics. In four years, a well-prepared student can receive the law degree and complete the pre-thesis requirements for the Ph.D. Further information may be obtained from the coordinator of the Department of Economics at gradofc@econ.berkeley.edu.

Lower Division Courses
1. Introduction to Economics. (4) Students will receive 2 units of credit for 1 after taking Economics 3 or Environmental Economics and Policy 1; no credit after taking Economics 2. Two hours of lecture and two hours of discussion per week. A survey of economics designed to give an overview of the field. (F,SP) Staff

2. Introduction to Economics—Lecture Format. (4) Students will receive no credit for 2 after taking 1; 2 units after taking 3 or Environmental Economics and Policy 1. Three hours of lecture and one hour of discussion per week. This course provides a survey of economics principles and methods. It covers both microeconomics, the study of consumer choice, firm behavior, and market interaction, and macroeconomics, the study of economic growth, unemployment, and inflation. Special emphasis is placed on the application of economic tools to contemporary economic problems and policies. Economics 2 differs from Economics 1 in that it has an additional hour of lecture per week and can thus cover topics in greater depth. It is particularly appropriate for intended economics majors. (SP) Staff

C3. Introduction to Environmental Economics and Policy. (4) Students will receive two units of credit for C3 after taking Economics 1. Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 1 or 2; and Mathematics 1A or 16A. Three hours of lecture and one hour of discussion per week. This course introduces students to the economic principles and methods used by environmental economists. (F,SP) Staff

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-3 to be graded on a passed/not passed basis. Sections 4-6 to be graded on a letter-grade basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments. Topics vary from department to department and semester to semester. Enrollment limited to 15 freshman.

98. Directed Group Study. (1-4 Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Written proposal must be approved by department chair. Seminars for the group study of selected topics, which will vary from year to year. Topics may be initiated by students. Staff

Upper Division Courses
100A. Economic Analysis—Micro. (4) Students will receive no credit for 100A after taking 101A or Undergraduate Business Administration 101A. A deficient grade in Undergraduate Business Administration 101A may be repeated by taking 100A. Three hours of lecture and one to two hours of discussion per week. Prerequisites: 1 or 2 or C3, or Environmental Economics C1. A survey of trends in the American economy; emphasis on factors explaining economic growth and the changing distribution of income and losses associated with growth. (F,SP) Staff

100B. Economic Analysis—Macro. (4) Students will receive no credit for 100B after taking 101B or Undergraduate Business Administration 101B. A deficient grade in Undergraduate Business Administration 101B may be repeated by taking 100B. Three hours of lecture and one to two hours of discussion per week. Prerequisites: 1 or 2, and Mathematics 1A or 16A. A study of the factors which determine national income, employment, and price levels, with attention to the effects of monetary and fiscal policy. (F,SP) Staff

101A. Economic Theory—Micro. (4) Students will not receive credit for 101A after taking 100A or Undergraduate Business Administration 101A. A deficient grade in Undergraduate Business Administration 101A may be repeated by taking 101A. Three hours of lecture and one to two hours of discussion per week. Prerequisites: 1 or 2, and Economics 1 or 2; and Mathematics 1A or 16A. A study of theoretical models and the theory of choice under uncertainty. Specific applications will vary from year to year, but will generally include topics from information economics and models of strategic interaction. (F,SP) Staff

101B. Economic Theory—Macro. (4) Students will not receive credit for 101B after taking 100B or Undergraduate Business Administration 101B. A deficient grade in Undergraduate Business Administration 101B may be repeated by taking 101B. Three hours of lecture and one to two hours of discussion per week. Prerequisites: 1 or 2, and Mathematics 1A and 1B. A study of the theories of the distribution of income, employment, and price levels, with attention to the effects of monetary and fiscal policy. (F,SP) Staff

C102. Natural Resource Economics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A, or Environmental Economics and Policy 100. Introduction to the economics of natural resources. Land and the concept of economic rent. Models of optimal depletion of nonrenewable resources and optimal use of renewable resources. Application to energy, forests, fisheries, water, and climate change. Resources, growth, and sustainability. Also listed as Environmental Economics and Policy C102. (F) Sunde

C103. Introduction to Mathematical Economics. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: Math 53 and 54. Formerly 103. Selected topics illustrating the application of mathematics to economic theory. This course is intended for upper division students in mathematics, statistics, the physical sciences, and engineering, and for economics majors with adequate mathematical preparation. No economic background is required. Also listed as Mathematics C103. Staff

104. Advanced Microeconomic Theory. (3) Three hours of lecture and zero to two hours of discussion per week. Prerequisites: 101A or consent of instructor. This course explores some issues in advanced microeconomic theory, with special emphasis on game-theoretic models and the theory of choice under uncertainty. Specific applications will vary from year to year, but will generally include topics from information economics and models of strategic interaction. Staff

105. History of Economic Thought. (3) Three hours of lecture per week. A survey of the theories of major economists from Adam Smith to Keynes. (F,SP) Staff

C110. Game Theory in the Social Sciences. (4) Students will receive no credit for C110 after taking Economics 104. Three hours of lecture and one hour of discussion per week. Formerly 135. A non-technical introduction to game theory. Basic principle, and models of interaction among players, with a strong emphasis on applications to political science, economics, and other social sciences. Also listed as Political Science C135. Staff

113. American Economic History. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisites: 1 or 2 or C3, or Environmental Economics C1. A survey of trends in the American economy; emphasis on factors explaining economic growth and the changing distribution of income and losses associated with growth. (F,SP) Staff

115. The World Economy in the 20th Century. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 1 or 2. Development of the world economic system with particular reference to worldwide trading relationships. This course is equivalent to History 160; students will not receive credit for both courses. Staff

119. Psychology and Economics. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 100A or 101A. This course presents psychological and experimental economics research demonstrating departures from perfect rationality, self-interest, and other classical assumptions of economics and explores ways that these departures can be mathematically modeled and investigated using positive and normative economics. The course will

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focus on the behavioral evidence itself, especially on specific formal assumptions that capture the findings in a way that can be incorporated into economics. The implications of these new assumptions are theoretical and empirical economics will be explored. (F,SP) Staff

121. Industrial Organization and Public Policy. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 100A or 101A. The organization of markets, the role of production in the U.S. economy. Determinants of market structure, business behavior, and economic performance. Implications for antitrust policy. (F,SP) Staff

122. Industrial Organization Seminar. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 121 and/or consent of instructor. Seminar on problems in the field of industrial organization. Seminar paper is required. Staff

123. Government Regulation of Industry. (3) Three hours of lecture per week. Prerequisites: 121. Problem of governmental regulation of industry and its public policy. Trade-off between production and environmental amenities. Assessing nonmarket value of environmental amenities. Remediation and clean-up policies. Environmental protection, and the interaction between government's actions. The course covers the analysis of the linear regression model and its application to empirical problems in economics. (F,SP) Staff

124. Special Topics in Industrial Organization. (4) Three hours of lecture per week. Prerequisites: 121. Analysis of market structure, conduct and performance in selected industries. See course announcement for current topics. Staff

C125. Environmental Economics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A, or Environmental Economics and Policy 100. Theories of externality and public good provision and environmental policy. Trade-off between production and environmental amenities. Assessing nonmarket value of environmental amenities. Remediation and clean-up policies. Environmental protection, and the interaction between government's actions. Also listed as Environmental Economics and Policy C101. (SP) Zilberman

126. Industrial Organization: Theory and Evidence. (3) Students will receive no credit for 126 after taking 121. Three hours of lecture per week. Prerequisites: 101A or consent of instructor. Structure, conduct, and performance of industrial markets in the United States; monopoly, oligopoly, and competition. Emphasis is on use of microeconomic theory and game theory to explain workings of markets, with use of mathematics as appropriate. Covers material similar to 121, but with more use of economic theory. (F,SP) Staff

131. Public Economics. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 100A-100B or 101A-101B. This course focuses on the role of the government in the economy from a theoretical and empirical perspective. The aim of the course is to provide an understanding of the nature of government intervention in the economy, analyzing the merits of possible government policies, and the response of economic agents to the government’s actions. The course covers the analysis of tax and public policy programs, environmental protection, and the interaction between different levels of government. Special emphasis is set on current government policy issues such as social security reform, income tax reform, and budget deficits. (F,SP) Staff

134. Macroeconomic Policy from the Great Depression to the Great Recession. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100B or 101B. This course will analyze the major economic challenges and policy responses in the United States over the past century. Among the key topics studied are the Great Depression and the New Deal; boom and bust monetary and fiscal policies in the early and post-World War II period; the Volcker disinflation and the Great Moderation; and the 2008 financial crisis and the Great Recession. (SP) Romer

136. Financial Economics. (4) Students will receive no credit for 136 after taking Undergraduate Business Administration 103. Students intending on majoring in Business should not take 136. Three hours of lecture and one hour of discussion per week. Prerequisite: 100A or 101A, and one semester of statistics. Analysis of financial assets and institutions. The course emphasizes modern asset valuation theory and the role of financial institutions in their regulation, in the financial system. (F,SP) Staff

137. Aggregate Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 136 and consent of instructor. Enrollment will be limited. A seminar paper is required. Staff

138. Financial and Behavioral Economics. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 100A or 101A, and Statistics 20, 21, 25, or 20 or upper division statistics course. This course is an advanced class in financial economics. Students are encouraged to bring papers on modern topics. (F,SP) Staff

153. Labor Economics Seminar. (4) Three hours of seminar per week. Prerequisites: 140 or 141, and 152 or 152 and consent of instructor. Topics in labor economics. Seminar paper required. Staff

154. Economics of Discrimination. (4) Three hours of seminar per week. Prerequisites: 140 or 141. Starting from Becker’s classic book on the economics of discrimination, this course will focus on issues of difference and discrimination associated with race, gender, and nation of birth. It will also regularly touch on credit and housing markets, education, and health care. The course looks carefully at the ways in which economics is used to address questions of discrimination. (F,SP) Staff

155. Urban Economics. (3) Three hours of lecture per week. Prerequisites: 100A or 101A. Application of economic theory to urban problems. Topics covered include location theory, housing, transportation, and the fiscal problems of city government.

157. Health Economics. (4) Three hours of lecture per week. Prerequisites: 100A or 101A. An economic analysis of policies and institutions in the U.S. health care sector. Topics covered include the supply and demand for health services, conceptual and policy issues relating to the provision of health insurance, and economic analysis of efficient regulatory policies toward the health care sector. (F,SP) Staff


52. The Chinese Economy. (3) Three hours of lecture per week. Prerequisites: 100A-100B or 101A-101B. The Chinese economy, its institutions, reform and transition to the market, and development. (F,SP) Staff

163. Special Topics in Economic Systems. (1.5) Three hours of lecture per week. Prerequisites: 1 or 2. Recommended: 161 or 162. As announced in the department course descriptions. Staff

C171. Economic Development. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A or 101A or Environmental Economics and Policy 100. Problems of institutional reform and transition, and development strategy. Also listed as Environmental Economics and Policy C151. (F) de Janvry

172. Case Studies in Economic Development. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: C171. A detailed study of the problems of development in a selected geographical area in Asia or Africa or Latin America. (F,SP) Staff

173. Economic Development Seminar. (4) Three hours of lecture per week. Prerequisites: 171 or 172 and consent of instructor. A seminar paper will be required. Staff

174. Global Poverty and Impact Evaluation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: At least one prior term of intermediate microeconomics (131) and some prior coursework in statistics. Rather than simply describing the causes and symptoms of global poverty, this course will explore the variety of tools available for rigorously measuring the impact of development programs. Through weekly case studies of field research, the course will cover impact evaluation theory and methods. The course will culminate with a final project in which each student will perform a basic impact evaluation of a policy or intervention. (SP) Miguel

C175. Economic Demography. (3) Three hours of lecture per week. Prerequisites: 1 or 2. Formerly 175.
A general introduction to economic demographic addressing the following kinds of questions: What are the economic consequences of immigration to the United States? Will increased nations be able to afford the health and pension costs of the aging populations? How has the size of the baby boom affected its economic well being? Why has fertility been high in Third World countries and low in industrial countries, why is a marriage postponed, divorce high, fertility so low, and extramarital fertility rising? What are the economic and environmental consequences of rapid population growth? Also listed as Demography C175. (SP) Lee

181. International Trade. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 100A-100B or 101A-101B. The theory of international trade and its applications to tariff protection. (F,SP) Staff

C181. International Trade. (4) Students will receive no credit for C181 after taking Undergraduate Business Administration 118. Three hours of lecture and zero to one hour of discussion per week. Prerequisites: 100A-100B or 101A-101B. The theory of international trade and its applications to tariff protection. This course is equivalent to UGBA 118; students will not receive credit for both courses. Also listed as Environmental Economics and Policy C181. (F,SP) Staff

182. International Monetary Economics. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: 100A-100B or 101A-101B. The balance of payments, the determination of the trade balance and income under fixed and floating exchange rates, money and prices in open economies, the internationalization of financial markets and its implications, the role of the International Monetary Fund, international interdependence, capital flows, and the determination of the exchange rate. (F,SP) Staff

183. International Economic Seminar. (4) Three hours of seminar per week. Prerequisites: 181 and 182 and consent of instructor. A seminar paper is required. Staff

190. Seminar on Topics in Economics. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: consent of instructor. A seminar focusing on current research in the field of the instructor. The topic and prerequisites will be announced before registration. Enrollment will be limited. A seminar paper is required. Staff

H195A. Senior Honors Thesis. (1-3) Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Senior honors candidates only (students with major GPA of 3.50 or better or permission of instructor). Preparation for writing a thesis, finding and organizing a topic, gathering data, and getting started. H195A is not prerequisite to H195B. (F,SP) Staff

H195B. Senior Honors Thesis. (1-3) Hours to be arranged. Prerequisites: Senior honors candidates only (students with major GPA of 3.50 or better or permission of undergraduate adviser). Writing a thesis under the supervision of a faculty member. Applications and details through the departmental under graduate office. H195A is not prerequisite to H195B. (F,SP) Staff

196. Special Topics in Economics. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Study in various fields of economics. Topics will vary from semester to semester and will be announced at the beginning of each semester. (F,SP) Staff

197. Field Studies. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. Written proposal must be approved by department chair. Supervised field studies in economics. Projects may be initiated by the students. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Written proposal must be approved by department chair. Seminars for the group study of selected topics, which will vary from year to year. Topics may be initiated by students. Staff

199. Supervised Independent Study and Research. (1-4) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged including independent study or passed/not passed basis. Prerequisites: Upper division standing. Written proposal must be approved by department chair. Enrollment is restricted. (F,SP) Staff

Graduate Courses

201A. Economic Theory. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 101A-101B, 204; Mathematics 53 and 54 or equivalent. Basic preparation for the Ph.D. program including theory of the firm and the consumer, game theory. (F,SP) Staff

201B. Economic Theory. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 101A-101B, 204; Mathematics 53 and 54 or equivalent. Basic preparation for the Ph.D. program including theory of the firm and the consumer, game theory. (F,SP) Staff

202A-202B. Macroeconomic Theory. (4,4) Three hours of lecture and two hours of discussion per week. Prerequisites: 100A-100B or 101A-101B or equivalent. Basic preparation for the Ph.D. program including aggrega tion theory, national accounting and index problems, monetary and fiscal policy, surveys of the implications of various expectations hypotheses, wage price determination, the role of money and financial assets, theories of consumption and investment, disequilibrium theory, dynamic systems, and international considerations. Staff

204. Mathematical Tools for Economics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 53 and 54 or equivalent and consent of instructor. The course provides a rigorous abstract treatment of the elements of real analysis and linear algebra central to current research in economics. The course develops in the students the ability to read mathematical proofs and to compose simple proofs on their own. (F,SP) Staff

206. Mechanism Design and Agency Theory. (3) Two hours of lecture per week. Prerequisites: 201B and 209A or consent of instructor. Formerly 209B. This course will study the optimal design of mechanisms in the presence of incomplete information and imperfect observability. The course will begin with the “classic” principal-agent problem and will then develop its applications to the “implicit contracts” theory of agency. Staff

207A-207B. Mathematical Economics. (3,3) Two hours of lecture per week. Twelve hours per week including class time and preparation. Prerequisites: Math 104 and 110 and Statistics 101. Mathematical analysis of economic theory. The problems treated are in current evolution and focus on the mathematical techniques and of economic topics as possible, including theorems of preference, utility, demand, personal probability, games and general equilibrium. Also listed as IDS 210. (F,SP) Staff

208. Microeconomic Theory Seminar. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

209A. Theory and Application of Non-Cooperative Games. (3) Two hours of lecture per week. Prerequisites: Consent of instructor. This course will study both pure and mixed strategies to such problems as oligopoly pricing, non-cooperative bargaining, predatory pricing, and optimal auctions. The focus will be on game theory as a modelling process as opposed to a body of known results. Staff

209B. Theory and Application of Non-Cooperative Games. (3) Two hours of lecture per week. Prerequisites: 209A or consent of instructor. The course may be repeated for credit. More thorough treatment of topics covered in 209A; and cover a selection of advanced topics. Staff

210A. Introduction to Economic History. (3) Two hours of lecture per week. Survey of some central themes in world economic history. Required of all Ph.D. candidates in economics. Staff

210B. Topics in European Economic History. (3) Two hours of lecture per week. Prerequisites: 210A. A survey of some central themes in European economic history. Staff

210C. Topics in American Economic History. (3) Two hours of lecture per week. Prerequisites: 210A. A survey of some central themes in American economic history. Staff

211. Seminar in Economic History. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

215A-215B. Political Economics. (3,3) Two hours of lecture per week. Prerequisites: 215A is a prerequisite to 215B. Tools of political economics: preferences and institutions, electoral competition, agency, partisan politics. Staff

215B-215C. Political Economics. (3,3) Two hours of lecture per week. Prerequisites: 215B is a prerequisite to 215B. Tools of political economics: preferences and institutions, electoral competition, agency, partisan politics. Staff

215B-215C. Economic Politics. (3,3) Two hours of lecture per week. Prerequisites: 215B is a prerequisite to 215B. Tools of political economics: preferences and institutions, electoral competition, agency, partisan politics. Staff

216. Seminar in Psychology and Economics. (3) Two hours of seminar per week. A graduate seminar in the field of behavioral economics. (F,SP) Della Vigna, Koszegi, Rabin

219A. Foundations of Psychology and Economics. (3) Two hours of lecture per week. Prerequisites: 210A-210B or consent of instructor. This course presents psychological and experimental economics research demonstrating departures from perfect rationality, self-interest, and other classical assumptions of economics and explores ways that these departures can be mathematically modeled and incorporated into mainstream positive and normative economics. The course will focus on the behavioral evidence itself, especially on specific formal assumptions that capture these findings in a way that is meaningful to economists. Economic applications will be used for illustrative purposes, but the course will emphasize formal theory. (F,SP) Staff

219B. Applications of Psychology and Economics. (3) Two hours of lecture per week. Prerequisites: 210A or 240A or consent of instructor. This course will build off of the material presented in 219A. It will
expand on the psychological and experimental econo-
omic research presented there but will emphasize a range of economic applications and especially empiri-
cal research. (F,SP) Staff

216C. Topics in Microeconomics and Economics. (3)
Two hours of lecture per week. Prerequisites: 220A-221B. This course will cover special topics that extend the material from 219A and 219B, with an emphasis on further empirical applica-
tions. (F,SP) Staff

220A. Industrial Organization. (3) Two hours of lec-
ture per week. Prerequisites: 220A. Continuation of
220A. The characteristics of regulated industries and
the consequences of regulation for economic perfor-
mance. Staff

220C. Special Topics in Industrial Organization. (3)
Two hours of lecture per week. Prerequisites: 220A. See course announcement for current topics. Staff

221. Seminar in Industrial Organization: Regula-
tion and Public Enterprise. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

222. Economics of Innovation. (3) Course may be repeated for credit. Two hours of seminar per week. Must be satisfactory/unsatisfactory. Staff

Study of innovation, technical change, and intellec-
tual property, including the industrial organization and performance of high-technology industries and firms; the use of economic, patent, and other bibliometric data for the analysis of technical change; legal and economic issues of intellectual property rights; sci-
cence and technology policy; and the contributions of innovation and diffusion to economic growth. Meth-
ods of analysis are both theoretical and empirical, econometric and case study. (F,SP) Staff

C222. Economics of Innovation. (3) Course may be repeated for credit. Students will receive no credit for C222 after taking 222. Three hours of lecture per week. Study of innovation, technical change, and intel-
lectual property, including the industrial organization and performance of high-technology industries and firms; the use of economic, patent, and other bibliometric data for the analysis of technical change; legal and economic issues of intellectual property rights; science and technology policy; and the contributions of innovation and diffusion to economic growth. Meth-
ods of analysis are both theoretical and empirical, econometric and case study. Also listed as Ph.D. in Business Administration C279I. (F,SP) Staff

224. Economics of Institutions. (3) Two hours of lecture per week. This course develops the proposition that institutions have pervasive ramifications for under-
standing economic organization. A comparative institu-
tional approach is employed whereby the transaction is made the basic unit of analysis, and alternative modes of organization are assessed with respect to their comparative costs, advantages, and disadvantages. Staff

C225. Workshop in Institutional Analysis. (3) STUDENTS will receive no credit for C225 after taking 225. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. This seminar fea-
tures current research of faculty, from Berkeley and elsewhere, and of advanced doctoral students who are investigating the efficacy of economic and non-
economic forms of organization. An interdisciplinary perspective—combining aspects of law, economics, and political science—will be pursued. Markets, hierarchies, hybrids, bureaucratization, and the supporting institutions of law and politics will be considered. The aspiration is to progressively build toward a new science of organiza-
tion currently called Ph.D. in Business Administra-
tion C272D. (F,SP) Staff

230A. Public Economics. (3) Two hours of lecture per week. The economic and policy analysis of gov-
ernment expenditures, taxes, and intergovernmen-
tal fiscal relations. 230A is not a prerequisite for
230B. Staff

230B. Public Economics. (3) Two hours of lecture per week. Government intervention changes oppor-
tunities and incentives for firms, families, individuals, service providers, and state and local government. This course considers the incentive effects of gov-
ernment expenditure programs. The primary empha-
sis will be in the examination of the effect of social expenditure programs on individuals and families. Most of the papers will be empirical. The course will not contain an explicit section on methodology and econometric techniques; instead, relevant economet-
ric techniques, data, empirical results, and research questions will be discussed in the context of the empirical liter-
ature. (F,SP) Staff

230C. Public Sector Microeconomics. (3) Two hours of lecture per week. The economic and policy analysis of government expenditures, taxes, and intergovern-
mental fiscal relations. (F,SP) Staff

231. Seminar in Public Sector Economics. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

234A. Macroeconomic Finance. (3) Three hours of lecture per week. Formerly 236D. Introduction to macroeconomic finance covers static portfolio choice, capital asset pricing model (CAPM), con-
sumption based models, dynamic equilibrium asset pricing theories, and current issues in behavioral finance. Strong emphasis on household finance and risk-sharing. Course is both theoretical and empirical. (F,SP) Staff

234C. Financial Decision Making in Firms. (3) Three hours of lecture per week. Prerequisites: 240A-240B or equivalent. This course provides a theoretical and empirical treatment of the core topics in corporate finance including internal corporate investment; exter-
nal corporate investment (mergers and acquisitions); capital structure and financial contracting; bankruptcy; corporate governance. (F,SP) Staff

235. Financial Economics Seminar. (3) Course may be repeated for credit. Two hours of seminar per week. This course presents speakers who work on the boundary of economics and finance, on topics including asset pricing, behavioral finance, and corporate finance. (F,SP) Staff

236A-236B. Aggregate Economics. (3,3) Two hours of lecture per week. Prerequisites: For 236A: 201A-201B and 202A-202B. For 236B: 236A. Macroe-
economic models; theory and practice of aggregate economic analysis in developed countries and developing countries. Also listed as Agricultural and Resource Economics C251. (F,SP) Roland

236C. Capital and Economic Growth. (3) Two hours of lecture per week. Formerly 202C: An examination of the roles of time and capital in the processes of indi-
vidual choice and the theories of production and dis-
tribution. The course will discuss the nature of capital and consider the role of capital accumulation in modern theories of economic growth and planning. (F,SP) Staff

237. Seminar in Advanced Macroeconomics and
Monetary Policy. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Staff

240A. Econometrics. (5) Four hours of lecture and
two hours of discussion per week. Prerequisites: 100A or 101A or equivalent; 100B or 101B or equivalent; Mathematics 11A or equivalent. Staff

Mathematics 11A or equivalent. Formerly 240B. Basic preparation for the Ph.D. program including probability and statistical theory and the classical linear regression model. Staff

240B. Econometrics. (4) Three hours of lecture and
two hours of discussion per week. Prerequisites: 240A or equivalent. Also listed for the Ph.D. program including generalized least squares; instrumen-
tal variables estimation; generalized method of
moments; time series analysis; and nonlinear models. (F,SP) Staff

241A. Econometrics. (4) Three hours of lecture per week. Prerequisites: Statistics 200A-200B or equiv-
lent and a course in linear algebra. Recommended: All 112. Intended for students specializing in econo-
metrics and others with strong mathematical back-
grounds. Linear and nonlinear statistical models and
their applications in economics. Special problems in analyzing data from non-controlled experiments. (SP) Staff

241B. Econometrics. (4) Three hours of lecture per week. Prerequisites: 241A. Simultaneous equations and
time-series models. Staff

242. Seminar in Econometrics. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 240A-240B. Staff

244. Applied Econometrics. (3) Three hours of lec-
ture per week. Prerequisites: 240A-240B. Methods of
applied econometrics, with emphasis on alternative modelling strategies and problems met in practice. Intended for doctoral students conducting empirical research. Staff

250A-250B. Labor Economics. (3,3) Two hours of lecture per week. Prerequisites: 250A is prerequisite to
250B. Consent of instructor. Analysis of labor market behavior. Staff

250C. Labor Economics. (3) Two hours of lecture per week. Prerequisites: 250B. Analysis of labor market behavior. Staff

251. Seminar in Labor Economics. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Seminar for stu-
dents at the doctoral dissertation level. Staff

260A-260B. Comparative Economics. (3,3) Two hours of lecture per week. Prerequisites: 260A is prerequisite to 260B. New issues raised by transition for economics. Political economy of reform: speed, sequenc-
ing, reform design, political economy of privatization. Allocative changes: speed of sectoral reallocation, price liberalization, output fall and macro-
economic dynamics. Political economy of institutional change. (F,SP) Roland

261. Seminar in Comparative Economics. (3) Course may be repeated for credit. Two hours of seminar per week. Staff

262A-262B. Macroeconomic Development. (3,3) Three hours of lecture per week. Prerequisites: Graduate standing. Theoretical and empirical analyses of poverty and inequality, household and community behavior, and contract and institutions in the context of develop-
ing countries. Also listed as Agricultural and Resource Economics C251. (F,SP) Roland

270A. Microeconomics of Development. (3) Three hours of lecture per week. Problems of underdevelopment and poverty, policy issues and development strategies. (F,SP) Staff

270C. Development Economics. (3) Two hours of lecture per week. Basic macro-policy planning with investment project analysis. Staff

270D. Special Topics in Development. (3) Two hours of lecture per week. Prerequisites: See course announce-
ment. See course announcement for current topics and prerequisites. Staff

271. Seminar in Economic Development and Plan-
ning. (3) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of in-
structor. Staff

274. Global Poverty and Impact Evaluation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: At least one prior term of inter-
national economics (i.e., 100A or 100B) and some prior coursework in statistics. Rather than simply describing the causes and symptoms of global poverty, this course will explore the variety of tools available for rigorously measuring the impact of development pro-
grams. Through weekly case studies of field research, the course will cover impact evaluation theory and
methods. The course will culminate with a final project

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in which each student will design an impact evaluation of a policy or intervention. (SP) Miguel

C275A. Economic Demography. (3) Two hours of lecture per week. Economic consequences of demographic change in developing and developed countries, including capital formation, labor markets, and intergenerational transfers. Economic determinants of fertility, mortality, and migration. Also listed as Demography C275F. (F,SP) Lee

275B. Selected Topics in Economic Demography. (3) Two hours of lecture per week. A review of recent literature in selected areas of economic demography; content will range from year to year.

C275B. Aging: Economic and Demographic Aspects. (2) Two hours of lecture per week for seven and one-half weeks. Course considers demographic and economic aspects of population aging. Also listed as Demography C236. (SP) Lee

280A. International Economics. (3) Two hours of lecture per week. The world economy as a general equilibrium system. The theory of international economics, trade policy. Staff

280B. International Economics. (3) Two hours of lecture per week. Prerequisites: 280A is not prereq- uisite to 280B. This course develops basic theoretical models for studying issues in open-economy macroeconomics. The current account and the trade balance, international capital market integration, develop- ing country debt problems, the real exchange rate, fiscal policy in the open economy, and international policy coordination. Staff

280C. International Economics. (3) Two hours of lecture per week. Prerequisites: 280B. This course is an empirical treatment per week. A foray into macroeconomic topics. Economic stability and economics and finance. Topics include trade elasticities, the determination of the trade balance and income under fixed and floating exchange rates, purchasing power parities, and current account versus capital flow, quantifying the degree of international capital mobi- lity, implications for the effectiveness of monetary and fiscal policy, international interdependence and coordination, models of exchange rate determination. (SP) Staff

281. Seminar in International Trade and Finance. (3) Course may be repeated for credit. Two hours of seminar per week. Staff

295. Survey of Research in Economics. (1) Two hours of lecture per week. Staff

296. Qualifying Examination. (1) Two hours of lecture per week. Staff

301. GSE Practicum. (6) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as graduate student; department consent of graduate advisor. Course credit for experience gained in aca- demic teaching through employment as a graduate student instructor. Staff

Education (Graduate School of Education)

Office: 1501 Tolman Hall, gse_info@berkeley.edu, (510) 642-5345 gsee.berkeley.edu

Dean: Judith Warren Little, Ph.D.

Professors
Anne E. Cunningham, Ph.D. University of Michigan. Cognitive consequences of literacy, reading process and disabil- ity.
Andrew A. deSessa, Ph.D. Massachusetts Institute of Technology. Physics and computation cognition
Sarah Warshaw, Ph.D. Stanford University. Teaching and learning written language
Bruce Fuller, Ph.D. Stanford University. Impact of public policy on schools, families, and classrooms
Bernard R. Gifford, Ph.D. University of Rochester. Policy analysis, technological assessment, W. Norkon Grubb, Ph.D. Harvard University. Education policy, labor market, and economic development
Susan D. Holloway, Ph.D. Stanford University. Socialization of young children.
Gayda Hull, Ph.D. University of Pittsburgh. Written language, technology, education, adult literacy
Claire Kramsch, Aegidierung de allarmen, University of Paris-Sorbonne. Sociocultural aspects of foreign language acquisition
Marcia C. Linn, Ph.D. Stanford University. Cognitive processes in children
Judith Warren Little, Ph.D. University of Colorado. Teachers’ work lives and careers; social policy and school reform; qualitative methods
Jabari Mahri, Ph.D. University of Illinois at Chicago. Literacy development in out-of-school settings
Kathleen E. Metz, Ed.D. University of Massachusetts. Development of scientific cognition in young children
Paul D. Pearson, Ph.D. University of Minnesota. Early reading and literacy assessment
Sopha Rabe-Hesketh, Ph.D. King’s College, University of London. Educational statistics, multilevel and latent variable modeling
Geoffrey B. Saxe, Ph.D. University of California, Berkeley. Mathematics education in children; culture and cognitive development
Alan H. Schoenfeld, Ph.D. Stanford University. Problem solving, metacognition, mathematical cognition
Harley Shaiken, B.A. Wayne State University. Skill formation, training, and labor markets
Elliot Turkel, Ph.D. Yale University. Social and cultural development
Barbara Y. White, Ph.D. Massachusetts Institute of Technology. Science education: cognition, computers, learning
Mark Wilson, Ph.D. University of Chicago. Psychometrics, educational statistics
Frank Worrell, Ph.D. University of California, Berkeley. Adolescence, African Americans, cultural identities, social development, talent development
Paul A. Ammon (Emeritus), Ph.D. K. Patricia Driscoll, Ph.D. Wendy Long Fillmore (Emerita), Ph.D. John G. Hurt (Emeritus), Ph.D. Jean Lave (Emerita), Ph.D. Carol B. Stack (Emerita), Ph.D. David S. Stern (Emeritus, Ph.D. James C. Stone (Emeritus), Ed.D. Paul T. Takagi (Emeritus), Ph.D. Alan B. Wilson (Emeritus), Ph.D.

Associate Professors
Nahid Suad Baki, Ph.D. University of California, Los Angeles. Learning, race, gender, equity, diversity, urban schools
Patricia Baquedano-López, Ph.D. University of California, Los Angeles. Language socialization, literacy development
Lisa Garcia Bedolla, Ph.D. Yale University. Immigration and education; political science; gender, race, and ethnicity
Cynthia E. Coburn, Ph.D. Stanford University. Relationships of policy and practice, teachers’ work, urban schools, qualitative research methods
Zeus Leonardo, Ph.D. University of California, Los Angeles. Critical social theory, agent-based virtual, school reform
Heinrich Minnott, Ph.D. Stanford University. Educational policy, school improvement, accountability systems, cross-national studies
Daniel H. Perinstein, Ph.D. Stanford University. History of education, urban school reform
Michael Ranney, Ph.D. University of Pittsburgh. Reasoning, learning, cognitive science

Assistant Professors
Dar Ahammash, Ph.D. Northwestern University. Learning sciences
Randi Engle, Ph.D. Stanford University. Classroom discourse, mathematics and science education, cognitive development, teacher-centered education
Xigia Newton, Ph.D. University of California, Los Angeles. Evaluation, research methods, mathematics and science education, teacher education
Janette T. Perry, Ph.D. University of California, Los Angeles. Education policy, urban schooling
Ingrid Seyer-Ochs, Ph.D. Stanford University. Political economy of urban education
Laura Ermirios, Ph.D. University of Rome. La Sapenza,” Ph.D. University of California, Los Angeles. Study of reading practices in different political settings, communities, and historical epochs
Tina Trujillo, Ph.D. University of California, Los Angeles. Educational equity, leadership reform, urban schools

Adjunct Professors
Maryl Gearhart, Ph.D. CUNY Graduate Center. Classroom assessment in elementary writing and mathematics
Erin Murphy-Graham, Ed.D. Harvard University. Cultural studies, gender equity, schooling in a global economy
Larry Nucci, Ph.D. University of California, Santa Cruz. Human development and moral psychology in educational contexts
Derek Van Rhee, Ph.D. University of California, Berkeley. Study of sport, culture, and education; athletics and academic excellence

Lecturers
Alisa Crovetti, Ph.D. University of California, Berkeley. Neurolinguistics, developmental disabilities, strategic reading in children and children’s reading and learning disorders, role of metacognition in strategic reading development
Richard McCallum, Ph.D. University of California, Berkeley. Reading, assessment, middle school, teacher education
Tony Miribel, Ph.D. University of California, Berkeley. Academic motivational issues of student athletes, diversity, reading development, school and non-school learning contexts
Kathryn Perry, Ph.D. University of California, Berkeley. Early school adjustment, student perceptions of schooling, educational equity
Gary Yabroff, Ph.D. University of California, Berkeley. Development of social and moral reasoning, children’s peer interactions

Academic Coordinators
Christine M. Ciko, M.A. Lehman College, CUNY. (English Credential Program)
Carolyn S. Hartsough, Ph.D. University of California, Berkeley. (School Psychology Program)
Rosalie N. Rodriguez, Ph.D. University of California, Berkeley. (English language learners, development and learning)
Elisa Salasins, Ph.D. University of California, Berkeley. (Developmental Teacher Education Program)
Richard Sterling, Cand. Phil. New York University. Assesss- ment, social dynamics, and the intersection of curriculum and domains of the workplace
Lynda Tredway, M.A. Catholic University. (Principal Leadership Institute)
Daniel J. Zimmerlin, M.A. University of California, Berkeley. (Mathematics in Science and Mathematics Education Program)

Graduate Program Overview

The Graduate School of Education is committed to high-quality scholarship and professionalism in order to prepare future leaders of education practice, policy, and research. Faculty research and teaching are grounded equally in theory and practice.

The Graduate School of Education offers Doctor of Philosophy (Ph.D.), Doctor of Education (Ed.D.), Master’s of Arts (M.A.), and credential degree pro- grams. The Ph.D. degree is designed for students interested in pursuing scholarly research and aca- demic careers in education. The Ed.D. is a pro- fessional degree designed for individuals seeking advanced professional preparation to become school administrators or educational leadership. The M.A. degree serves the interest of stu- dents who want to carve out a career in education, either as an education researcher or as an educ- ation policy scholar. The Ed.M. degree, who all contain an M.A. component, are designed for stu- dents who plan to work in schools as teachers, principals, districts and county administrators, and school psychologists.
Areas of Study

Degree and credential programs are grouped under three main areas of study: (1) cognition and developmental processes in education; (2) language and literacy, society, and culture; and (3) policy, organization, measurement, and evaluation.

Cognition and Development (CD) focuses on the interplay among cognitive, social, and developmental processes in diverse areas of human knowledge and experience. Faculty concentrate on learning in mathematics, science, and technology, as well as a wide range of issues involving cognition, social, and emotional development. Faculty and student research typically occurs in field settings (e.g., classrooms), providing fertile sites for conceptual advances, as well as the improvement of educational practices. CD supports both professional and academic programs, each enriching the other in courses and research opportunities.

Faculty and students in Language and Literacy, Society and Culture (LLSC) study, design, and participate in transformative approaches to individual and social development in schools and in diverse contexts of communities, workplaces, and social movements. They focus on methodically grounded examinations of talk and activity, and on literacy, through historical and sociocultural theories to understand and inform the ecology of learning and schooling. Of special concern is how to work toward equity and social justice for students, groups, families, and communities, including non-native speakers of English. Offerings include both professional and academic programs.

Programs in Policy, Organization, Measurement, and Evaluation (POME) emphasize: (1) the study of schools, school systems, and school systems; (2) the formulation and effects of educational policy; and (3) methods of research, measurement, and evaluation. POME students enter as a cohort, take courses together, join faculty research groups, and cultivate their own areas of interest and expertise in education. POME faculty have strengths and interests that combine:

- a focus on the institutions of schooling analyzed from various disciplinary perspectives, including social, political, and developmental functions;
- experience in linking research, policy, and practice at the local, state, and national levels;
- a breadth and depth of methodological, measurement, and evaluation expertise to conduct policy-oriented research and to inform sound institutional leadership and decision making; and
- the analysis of and practice related to leadership in schools at both school and district levels.

Leadership for Educational Equity Program (LEEP) is a school-wide Ed.D program that offers a three-year course of study with evening, weekend, and summer schedule to accommodate the needs of working professionals. LEEP uses a combination of coursework, field experiences, and seminars, with faculty members in small seminar settings. Enrollment limited to 15 freshmen.

Undergraduate Minor in Education

The School of Education offers a minor in education for undergraduates currently enrolled at Berkeley. This education provides an opportunity to examine systematically an institution that occupies a unique position in society and profoundly influences virtually everyone. This program is designed to develop a critical understanding of the relationship of education to the development of societies and individuals. Its focus is on the potential as well as the diversity of forms of education. The minor offers an opportunity for intellectual inquiry to broaden and complement students’ work in their major fields of study. In the process, students will encounter the wide array of professions possible to students in the field of education, enabling those considering a career in the field to make an informed choice.

Lower Division Courses

C1. Introduction to Cognitive Science. (4) Three hours of lecture and two hours of laboratory per week. Consent of instructor.

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: Priority given to freshmen. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an introductory topic with a faculty member in a small seminar setting. Enrollment limited to 15 freshmen.

30AC. Race and Ethnicity inside Schools. (4) Four hours of lecture/discussion per week. Formerly 40AC taken before fall 2004. Racial and ethnic minorities in American schools and colleges through case studies of Native Americans, Italian Americans, and Mexican Americans. Policies, practices, ideologies, experiences, and outcomes from the perspective of both dominant and ethnic/racial groups. This course satisfies the American Cultures requirement. (F) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Priority given to freshmen. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. Staff

40AC. Experiencing Education: Diversity and (In)Equality in and Beyond Schools. (3) Three hours of lecture and two hours of discussion per week. Explores the complex relationship among diversity, equality, and educational systems by focusing on the conceptual categories of race, class, and gender in the organization of educational opportunity. Explores the ways in which these categories intersect in people’s lives. Incorporates a semester-long project that enables students to develop research skills as they apply their new understandings to the educational challenges facing local districts and communities. This course satisfies the American Cultures requirement. (F) Seyer-Ochi

52. Understanding Language in Society. (3) Three hours of lecture/discussion per week. This course explores how language is influenced by social factors. The topics include dialects and standard English, slang, and the influence of gender, identity, and bilingualism. Students will examine the diverse ways in which people use language to communicate with one another. A secondary objective is to teach strategies that are proven effective for successful and efficient reading, writing, learning, and studying. These strategies will be applied to the content of this class and be useful in students’ other classes. (F,SP) Van Rheenen

75. Introduction to Sport in Higher Education. (3) Three hours of lecture/discussion per week. This course addresses both the socio-cultural context of sport in higher education as well as the individual’s experience within this particular context. The course will examine the evolution of the amateur athlete in the 19th century and subsequent commercialization of college sports within the 20th century. Particular areas of focus will be the NCAA, the media portrayal of the American “student-athlete,” as well as identities of race, class, gender, and sexual orientation and identity and sport in higher education. (F,SP) Van Rheenen

75AC. American Sports, Culture, and Education. (3) Three hours of lecture per week. American sports and athletes have come to signify a complex of variegated meanings that include desire but also disdain. Through the work of a variety of scholars, researchers, and journalists, this course explores the nature and motives of societal structures and practices (embodied in both institutions and individuals) to illuminate the interrelations and reciprocal influences of society and sport. The central framework of this course draws on the notion that the space of sports is defined by highly structured societal practices and consumptions. In analyzing a variety of these practices, this course attempts to ground a partial reading of other societal forces in American culture. In particular, the course examines the nuanced intersections of sport, race, identity, social class, and gender, highlighting the ways in which American sports provide a potential vehicle for social mobility and integration while simultaneously reproducing existing cultural stereotypes and structures of inequality. This course satisfies the American Cultures requirement. (F,SP) Van Rheenen

90F. Learning from Text in Ethnic Studies. (1-2) One to two hours of lecture/discussion per week basis. Must be taken on a passed/not passed basis. Formerly 90. This course assists undergraduates with reading and study skills. Students learn successful approaches to learning from their texts in ethnic studies. (F,SP) Staff

97. Field Studies. (1-4) Course may be repeated for credit. Field study. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshman and sophomores. Consent of instructor. University organized and supervised field programs involving experiences in schools and school-related activities. (F,SP) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit as topic varies. See Introduction to Courses and Curricula section of this catalog. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Staff

Supervised Independent Study. (1-4) Course may be repeated for credit as topic varies. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Tutorial. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Low division independent study or research on topics relevant to education that are not covered in depth by other courses. Topic is to be initiated by students. (F,SP) Staff

Upper Division Courses

112. Reforms in Elementary Education: Psychological and Sociocultural Foundations. (3) One hour of lecture, one hour of discussion, and one hour of group work per week. Prerequisites: Consent of instructor. Background in psychology. The course introduces students to relationships between research on cognitive development and reforms in elementary teaching. The syllabus is organized in modules that link research and classroom practice. For example, in a module on children’s mathematics, students analyze the research on children’s strategies for solving math problems and consider how this research has reformed teaching practices. Students complete a project for each module that links research and observation.
vations in elementary classrooms through concurrent enrollment in unit of 117. (SP) Gearhart

114A. Early Development and Education. (4) Three hours of lecture and two hours of fieldwork per week. Theory and research on psychological development from birth through childhood with special attention to relations between developmental theory and educational practice. Directed field observation of developmental phenomena and educational practices. Staff

114D. Practicum in Early Development and Education. Children Birth to Age 5. (4) Two hours of lecture and six hours of fieldwork per week. Prerequisites: 114A recommended. This course will provide students with an understanding of theories and practices in early childhood education, specifically working with children from birth to age 5. It will also provide an opportunity for students to apply knowledge and reflect upon experiences teaching in a high-quality environment for young children. Course topics will span infant, toddler, and preschool early care and education programs and the age groups for whom such programs are designed. Special attention will be given to: (1) curriculum approaches and theories in early care and education programs; (2) educational practices related to culturally, linguistically, and economically diverse student populations; and (3) child observation and classroom organization and practices. In addition, the course will provide experiences in which students and their teachers, programming for children with special needs, teacher relations with children, parents and other staff, peer relationships, managing challenging children and identifying qualified children, experience will include working with young children in an infant, toddler or preschool quality program on the Berkeley campus or in the surrounding area. (SP) Staff

C116A. Perspectives on the Young Child in Society. (3) Two hours of lecture and one hour of discussion per week. This course provides a multidisciplinary approach to understanding the development needs of children from birth to age 5 in the context of the varied social institutions which they are socialized for and educated. Specific attention will be focused on how children’s experiences within and beyond their families vary by social class, ethnicity and language, family needs and preferences, and special needs. Students will examine how expectations for young children change over time and will become familiar with current and past policy debates about the education and social well-being of young children. Also listed as Social Welfare C128 and Psychology C104. Staff

130. Knowing and Learning in Mathematics and Science. (3) Three hours of lecture and one hour of fieldwork per week. This course offers a multifaceted approach to collaborative problem-solving and reflection activities through which students will be able to appreciate and develop a coherent, effective approach to the teaching and learning of any mathematical or scientific conceptual domain. Issues of cognition, culture, and pedagogy will emerge from participants’ struggles to explain their own reasoning. In-class problem-solving experiences will provide grist for reflection. Extensive readings will be done in a bSpace forum. Students are placed— and do course projects— in local classrooms. (SP) Abrahamson

140AC. Literacy: Individual and Societal Development. (3) Three hours of lecture/discussion and workshops per week. This course combines theory and practice in the study of literacy and development. It will introduce sociocultural educational theory and research focused especially on literacy teaching and learning, and this literacy will be examined in practice through participation in computer-based after-school programs. In addition, the course will contribute to undertaking of race, culture, and ethnicity in the United States. We will develop a view of literacy, not as a neutral skill, but as depending for its meaning and its practice upon social institutions and conditions. This course satisfies the American Cultures requirement. (F,SP) Staff

143. Introduction to the Teaching of English. (3) Two hours of lecture and three hours of fieldwork per week. Prerequisites: Upper division standing or consent of instructor. Exploration of issues confronting English and Language arts teachers today; curriculum trends and issues; influence or reform efforts since the 1950s on English and Language arts curriculum and practice; course assignments to include fieldwork, interviews, reading and reports. Sterling

C145. Literacy through Literature. (3) Three hours of lecture per week. Formerly 145. Exploration of the role that literacy can play in the acquisition of literacy in a first and second language. Linguistic and psycholinguistic issues: orality and literacy, discourse and text, schema, and reader meaning. Literary issues: stylistics and critical reading, reader response, structure of narratives. Educational issues: the literary text in the social context of its production and reception by intended and non-intended readers. Also listed as German C106. Kramsch

149. Foundations for Teaching Language Arts. (3) Three hours of lecture per week. Prerequisites: Admission to a teaching credential program. Lectures and workshops on curriculum, instructional theory, and methods for teaching language arts in elementary schools. Incorporates competencies for Reading Instruction Competency Assessment (RICA) and for teaching children whose primary language is not English. Staff

158. Foundations for Teaching Reading in Grades K-8. (2-3) Three hours of lecture per week. Prerequisites: Admission to a teaching credential program (summer session excluded). Formerly 258A-258B. Introduction to reading and writing instruction in the four- and five-year-old child. Reading and writing instruction in the elementary school, instructional methods and approaches, assessment procedures, and reading and writing theories. Cunningham

160. Foundations for Teaching Social Studies. (1) Three hours of lecture each week. Prerequisites: Admission to a teaching credential program. Formerly part of 149. Lectures and workshops on curriculum, instructional theory, and methods for teaching social studies methods in elementary schools. Staff

162A. Teachers’ Work. (3) Three hours of lecture/discussion per week. This course is offered as part of the undergraduate education minor. examines the multiple dimensions of teachers’ work by drawing on theories of teacher socialization and teacher professional learning, and exploring representations of teachers in the media and popular culture, as well as in relevant academic literature. Students will be introduced to the current policy, social, cultural, historical, professional, employment and legal context of teachers’ professional lives. Students will have the opportunity to examine these aspects of teachers’ work by interacting with teachers in the field. (SP) Little

180. Logic of Inquiry. (3) Three hours of lecture per week. An analysis of the logical and epistemological foundations of empirical research with the aim of developing a critical and rigorous approach to empirical inquiry, deductive and inductive logic, the structure of scientific theories, justification, falsification, the role of values, prediction, and the nature of causality. Staff

C181. Race, Identity, and Culture in Urban Schools. (3) Three hours of seminar/discussion per week. This course will focus on understanding urban schools as a part of a broader system of social stratification and the process by which students in urban schools come to a sense of themselves as students, as members of cultural and racial groups, and as young people in America. Topics include racial identity; race/ethnicity in schools; urban neighborhood contexts; and school-level examination of the experiences of students in urban schools. Students will also integrate course readings with their own first-hand experience working in one of several off-campus sites. This course has a mandatory community engagement component that will meet 1 unit within the field study (179) credit. Also listed as African American Studies C133A. (SP) Sudat-Bakari

184. Philosophical Foundations of Education. (3) Three hours of lecture per week. Systematic survey of educational thought with an emphasis on the epistemological, logical, and ethical foundations of the major philosophical theories of education. (F,SP) Staff

185. Gender and Education in the Americas. (3) Three hours of lecture/seminar per week. This course is designed to provide an overview of the major dissociations and debates in the area of gender and education. The main questions this course addresses are: What role does education play in defining and reproducing gender roles? How can education promote gender equality? We will explore these questions through a series of readings and case studies from the United States, Canada, and Latin America. The course will begin by surveying progress toward gender equality in formal education over the past century. We will examine how social movements, government policies, and international conventions have generated greater educational opportunities for both males and females. In the second part of the course, we will examine a variety of topics that illustrate how we learn about gender in both schools and in other educational settings. Topics will include academic course taking patterns and social class. (F) Murphy-Graham

186AC. The Southern Border. (4) Four hours of lecture/discussion per week. The southern border—from California to Florida—is the longest physical divide between the First and Third Worlds. This course examines the border as a symbol and a real place where North-South relations take on a specific spatial and cultural dimension, and as a region which has been the testing ground for such issues as free trade, immigration, and ethnic politics. Also listed as Ethnic Studies 159AC and Geography 159AC. This course satisfies the American Cultures requirement. Manz, Shakan

187. Cooperatives and Community Development: Education for Ownership. (3) Three hours of lecture per week. Through fieldwork students will examine community development strategies to strengthen communities, create economic opportunity and provide needed services. Examines the fundamental role of education in creating member-owned, democratically controlled organizations. Students will design and assess the feasibility of their own cooperative venture. Hurst

189. Democracy and Education. (4) Four hours of lecture per week. Prerequisites: Junior standing or consent of instructor. The role of education for furthering the ideals of democratic societies—critical study of principles, philosophies, theories, and practices designed to develop understanding, commitment, and skills to empower a citizenry dedicated to achieving equality, justice, and peace in the world. Hurst

190. Current Issues in Education. (4) Four hours of lecture/discussion per week. Through lecture and discussion, students will examine current issues in education. Coursework will begin with a critical history of education. Students will also examine different educational philosophies, purposes, and methods. Students will use this information as an aid in analyzing several problem areas. Addressed are not limited to but will include democracy and education, testing and assessment, politics and education, and education and social inequality. (F,SP) Hurst

190B. Unraveling Education: A Participatory Inquiry. (4) Four hours of lecture per week. Prerequisites: 190. Course builds upon 190. Through dialogue, students will further explore critical issues and their connections. Students will form small working groups to identify, develop, investigate, and teach a topic of their choosing. We will develop and emphasize multiple perspectives. Hurst

C193A. Environmental Education. (3) Five and one-half hours of lecture/discussion and six hours of fieldwork per week. Theory and practice of translating ecological knowledge, environmental issues, and values into educational forms and programs that we all facets of society, including schools. Concentrated
experience in participatory education. Also listed as Envir Sci, Policy, and Management C193A. Hurst C193B. Environmental Education. (3) Five and one-half hours of lecture/discussion and six hours of fieldwork per week. Theory and practice of translating ecological and environmental information and values into educational forms for all age levels and all facets of society, including schools. Concentrated experience in participatory education. Also listed as Envir Sci, Policy, and Management C193A. Hurst 195. Special Topics in the Foundations of Teaching. Course may be repeated for credit. One hour of seminar per week per unit. Prerequisites: Consent of instructor. Topics to vary from semester to semester and section to section. 195A. Special Topics in the Foundations of Teaching. (1-4) School administration. Staff 195B. Special Topics in the Foundations of Teaching. (1-4) Reading and language arts. Staff 195C. Special Topics in the Foundations of Teaching. (1-4) Mathematics and science. Staff 195D. Special Topics in the Foundations of Teaching. (1-4) Psychology as applied to teaching. Staff 197. Field Studies. (1-4) Course may be repeated for credit. One to four hours of fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. University-organized and supervised field programs involving experiences in schools and school-related activities. (F,SP) Staff 198. Directed Group Study. (1-3) Three hours of seminar per week. Prerequisites: Consent of instructor. Topics to vary from year to year in the areas denoted by the titles of the following sections: (1) Cognitive Development; (2) Learning and Memory Development; and (3) Language. Cunningham or Gearhart 199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Independent study. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP) Staff Graduate Courses 200A. Cognitive Development. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Development of cognition from birth to maturity. Piagetian and information processing theories and research. Social and cultural factors. Normal human development; secondary emphasis on atypical and animal cognition. Infant perception and cognition, early childhood competencies, memory and problem solving in middle childhood and adolescence. Infant perception and cognition. Vygotsky's theory. Primary emphasis on cognitive development and values as psychosocial factors affecting correlates. We examine: (1) how social and personal identity factors are used to explain underachievement, (2) cognitive development and stereotypic threat; (2) the role of identity in different cultural groups; (3) the impact of these factors on teacher and student behavior; and (4) the role that identity plays in helping students develop a sense of future. (F,SP) Staff 200E. Neo-Vygotskian Perspectives on Cognitive Development. (3) Three hours of seminar per week. Prerequisites: 200C or its equivalent. This seminar explores interpretations of Vygotsky's writings on cognition and its developmental foundations. The seminar will consider Vygotsky's books, Thought and Language and Mind in Society, and also read scholars who build on Vygotsky's seminal ideas—including his founding ideas on microgenetic research. Three hours of seminar per week. Staff 201A. Psychology of Reading. (3) Three hours of lecture per week. Comparison and analysis of the psychological and linguistic evidence underlying whole language and skills methods of reading instruction. Topics include reading readiness, emergent literacy, the English spelling system and decoding, vocabulary development, models of reading, individual differences, and comprehension and schema theory. Cunningham 201B. Seminars in Intellectual Development. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Relevant courses from the 200 sequence and consent of instructor. Intensive examination of advanced topics, which will vary from year to year, as determined by the titles of the following sections: (1) Social Development; (2) Learning and Memory Development; and (3) Language. Cunningham or Gearhart 202D. Seminars in Social and Personality Development. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Relevant courses from the 200 sequence and consent of instructor. Intensive examination of advanced topics, which will vary from year to year, in the areas denoted by the titles of the following sections: (1) Social Development; (2) Motivation; and (3) Personality Development. Turiel 204C. Research Seminars: Inquiry in Educational Psychology. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. The doctoral program in educational psychology requires that students complete extensive projects of documentary and empirical research. As they engage in these projects, students will enrolled (ordinarily during alternate years) in appropriate sections of this seminar. At each meeting, participants will present their own projects and analyze those presented by others. Wonnell 205. Instruction and Development. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. An examination of cognitive developmental approaches to instruction. Review of different theoretical orientations to learning and memory, metacognition, educational technology and current research and their application to elementary and secondary schools. Wonnell 207B. Individual Appraisal of Intelligence. (4) Three hours of lecture and six hours of fieldwork per week. Prerequisites: Consent of instructor. Theories of intelligence, measurement concepts applied to intelligence tests, development, administration and interpretation of the WISC-R, Stanford-Binet, and other IQ measures for use with exceptional individuals. Staff 207C. Diagnosis of Human Handicaps. (4) Three hours of lecture and six hours of fieldwork per week. Prerequisites: Consent of instructor. Reviews current theories and research and eligibility for handicapped pupils and technical aspects of evaluation. University supervisors will evaluate and provide feedback. Staff 207D. Assessment and Education of Exceptional Pupils in Regular Classes. (2) One hour of lecture per week and one hour of discussion per week. Methods for assessment of handicapped children and implications for their education in regular classes. Topics as nondiscriminating testing, least restrictive environments, alternative programs, parent communication, interpersonal relationships, characteristics, behavior of exceptional pupils are covered in studies of individual and/or group pupils. Staff 211A-211B. Human Development and Education. (4,4) Three hours of lecture/discussion and two hours of fieldwork per week. Prerequisites: Admission to Developmental Teacher Education Program or consent of instructor. Introduction to theories of human development and their application to elementary and preschool education. Topics include cognitive development, moral and social development, language acquisition, psychosocial perspectives on social-emotional development and a study of structural and analysis of classroom organization. Also supervised child study, individual and small group tutoring, and field experiences. Gearhart 211C-211D. Advanced Human Development and Education. (4,4) Three hours of lecture/discussion and three hours of fieldwork per week. Prerequisites: Admission to Developmental Teacher Education Program or consent of instructor. Advanced principles of human development applied to teaching and learning school subjects. Also supervised child study, individual and small group tutoring, field experiences. Wonnell 212. Adolescent Development and the Teaching of Secondary English. (3) Three hours of lecture/discussion and two hours of fieldwork per week. Prerequisites: Consensus of instructor. This graduate seminar relates the goals of secondary English teaching to three major conceptual frameworks: the study of adolescence; rationality, morality, and identity. These themes are then explored with reference to urban youth, along with other themes emerging from research in urban settings. The theme of identity is pursued further through a consideration of adolescents’ “self-theories” and their motivational consequences. Students write papers on related topics for a class anthology. (F,SP) Ammon 213A. Conceptual Bases for School Psychology. (3) Three hours of lecture and six hours of fieldwork per week. Prerequisites: Consent of instructor. An overview of the professional specialty of school psychology. Staff 213B. Theoretical and Scientific Bases for School Psychology Practice. (3) Three hours of lecture per week. Examines the empirical evidence for developmental and learning models in relation to the school curriculum and school organization from elementary through high school. Staff 213C. School-Based Consultation. (3) Three hours of lecture per week. Theories of consultation, consultation methods, and research on consultation applications in educational settings and the detection of school failure and school psychology practice. Wonnell 213D. Educational Interventions for the School Psychologist. (3) Three hours of lecture per week.
Theories and procedures for individual and group assessment of children’s learning and behavior problems as applied to the design of individual and group programs in the classroom. Staff

213L. Laboratory in Social Psychology. (1) One hour of discussion and six hours of fieldwork per week. Must be taken on a satisfactory/unsatisfactory basis. Laboratory section to evaluate fieldwork records and for supervision of school assignment. Must be taken concurrently with 213A-213B-213C. Staff

214. Human Development and Education Seminar. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduates of instructor’s Region and discussion of original research in the area of human development and education. Not all participants are required to report in any given semester, but all are expected to attend and to enter into the discussions. Strongly recommended for all students in the graduate program in human development and education. Holloway

215. Socialization Processes Within the Family. (3) Three hours of lecture per week. This course provides an introduction to the study of socialization processes as they are reflected in the behavior of children. Staff

221A. Towards Ambitious Instruction in Mathematics: Research Into Practice. (3) Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. In this course, students learn to turn mathematics education research into practice through the implementation of lesson design. Students work in collaborative teams consisting of one beginning mathematics teacher in a teaching credential program and one or more doctoral student researchers. Together each team designs a full lesson, teaching, implementing, researching, and re-designing a lesson that seeks to embody one key aspect of the teacher’s vision of effective mathematics instruction. (F,SP) Engle

221C. Scientific Cognition: Development, Learning, and Instructional Design. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Examination of the relationship between development, learning, and instruction of scientific cognition, from the perspectives of the cognitive developmental and cognitive instruction research literatures. The course project takes the form of the design, implementation, and microgenetic analysis of a short-term educational design experiment. Emphasis on K-8. (SP) Metz

223B. Special Problems in Mathematics, Science, and Technology Education. (2-6) Course may be repeated for credit. Consent of instructor required. Two to six hours of lecture/discussion per week. Study of special problems and issues in education related to mathematics, science, and technology. Sections may vary from semester to semester. Staff

224A. Mathematical Thinking and Problem Solving. (3) Three hours of lecture per week. This course explores contemporary research on mathematical cognition, with a particular emphasis on “higher order thinking skills” and mathematical problem solving. We discuss various frameworks for characterizing mathematical behavior and various methodologies for examining “intelligent” mathematical thinking. The course incorporates an integral element of our EMST curricular sequence, this course includes a major course project. In their project, students engage in research incorporating the main ideas studied in the course. Schoenfeld

224C. Gender, Mathematics and Science. (3) Three hours of seminar per week. The course explores commonly asked questions concerning gender, mathematics, and science. We will discuss whether these are appropriate questions and examine evidence related to the questions. This course will also consider whether policies and practices concerning gender, mathematics, and science should be changed and, if so, identify some of the steps that could be taken to improve the current situation. Linn

224D. Survey of Current Research and Issues in Mathematics Education. (3) Three hours of seminar per week. This course builds foundational knowledge of important contemporary issues and research in mathematics education. The course is designed around readings, discussion, and course activities aimed at developing a comprehensive grounding in the literature on current research and innovations in the mathematics education field. As well as historical debates surrounding student achievement, curriculum, teaching practice, and teacher preparation. (SP) Suad-Bakri

226. Constructive Epistemology. (3) Three hours of lecture per week. Many approaches to education take the knowledge to be taught as fixed, and the manipulable objects to be things like methods. By focusing on knowledge per se—what is it? how is it organized and encoded in humans?—we are led to questions about what should be taught, based on principles of learnability, etc., rather than just “effective methods.” This tactic is valuable in view of the radical changes information technology may have on what we need to teach and what general areas are teachable. di Sessa

228A. Qualitative Methodology. (3) Three hours of lecture/discussion per week. The course will be organized by principal activities: group readings, book reports, expert and novice methodology presentations, in-class activities, and student research. For each activity, we will look at the full breadth of methodology, from “how-to” methods and specific areas of concern to general questions including: What constitutes objective data? What are strengths and weaknesses of methods in regard to various issues? What are the relations between theory and data? Metz, Saxe

C229A. Proseminar: Problem Solving and Understanding. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Students will examine problem solving in children and adults, from a predominantly cognitive science perspective, beginning with an examination of thinking involved in diverse problem types. Students will then analyze the literature concerning cognitive issues that transcend problem types, including representation, “understanding,” and access to one’s own cognitive processing, categorization, the architecture of knowledge, and the control of cognition. Also listed as Psychology C223.

29D. Discourse and Learning in Math and Science Classrooms. (3) Three hours of seminar per week. Prerequisites: Grade of B or better in 231 or instructor consent. This course is designed to examine important questions about the nature of language, the meanings of “grammar,” the varieties of English, and the development of language in school and out of school. The course is organized around readings, in-class research and analysis, and student reports, expert and novice methodology presentations. Staff

240A. Language Study for Educators. (3) Three hours of lecture/discussion per week. This course will introduce students to the broad areas of language study and explore the implications of such study for teaching and learning. Among course topics are the nature of language, the meanings of “grammar,” the varieties of English, and the development of language in school and out of school. The course will be required for all Ed.D. students and recommended as an introductory course to all students who have had no formal coursework in linguistics. Baquedano-López

240B. Theoretical Issues in the Study of Literacy. (3) Three hours of seminar per week. Formerly 240C. Students will review trends in literacy theory, and then will examine current theories of written language acquisition and literacy learning. Connections will be made between research, theory, and current educational practices. Staff

240C. Issues in First and Second Language Acquisition. (3) Three hours of seminar per week. Prerequisites: Course in linguistics or language acquisition. Formerly 254C. This course deals with issues related to language learning and development in school-age children: How do they acquire the language skills needed for literacy and academic development? How do children make the transition from home to school language use? How do children learn a second language? What happens when learning a second language results in the loss of the first language? We will consider the educational, social, and cognitive implications of these issues. Staff

240D. Foundations of Curriculum Theory in the United States: A Survey of New, Emerging Literacies. (3) Three hours of seminar per week. This course explores the development of curriculum theory and the role of the curriculum specialist in the United States since the Progressive Period. Emphasizing a survey of classic texts and key figures, the course covers the development of three schools of thought: social efficiency approaches, child-centered approaches, and social reconstructionist approaches. It concludes with a study of curriculum theory since the Reconstructionists. (F) Staff

241B. Language Socialization. (3) Three hours of seminar per week. Throughout the lifespan, we are socialized through language to become competent participants and members of various groups and communities, including schooling institutions. For the past
20 years, this theory and method for analyzing human development has made important contribution to our understanding of how we learn to become competent members of community, how we learn through language, and how we are socialized into language. This course will provide opportunities to overview the theoretical cornerstones of language socialization as a field and review current research and chart future research trajectories. Course participants are expected to collect and analyze audio/video data from any educational and other learning context where language socialization might be taking place. (F) Baquedano-López

241C. Narrative across Learning Contexts. (3) Three hours of lecture per week. The study of narrative has solidified into an important body of literature that is of particular relevance to educators. Across learning contexts and at all levels of lexical processing, as such, it underlies many learning activities. We tell narratives for their potential to explain, rationalize, and delineate past, present, and possible experience. This narrative as a collaborative undertaking, co-told and -designed with the audience’s input, addressing an audience’s present and future concerns. Narrative can thus potentially create shared understandings and community among those participating in narrative activity, yet narratives can become sites for rejection and contestation. Narrative is also a socializing tool. The course will also address methodological approaches to the study of narrative that are relevant to the field of education. Students enrolled in this course are expected to collect narrative samples from naturally occurring interactions (video- and audio-taped conversations, classroom interaction), written narrations, (F) Baquedano-López or Sterponi

241D. Perspectives on Classroom Discourse. (3) One hour of lecture and two hours of discussion per week. This course is designed to provide opportunities for students to observe and analyze classroom talk and interaction, and the language of classroom material and ideological artifacts. In this course, we will survey the classic literature on classroom discourse and we explore new orientations to the study of classroom talk. We will draw from literature from interrelated disciplinary perspectives that include linguistics, language socialization, linguistic anthropology, conversation analysis, ethnmethodology, and the ethnography of speaking. (SP) Baquedano-López or Sterponi

244B. Methods for Teaching English in the Secondary Schools. (4) Four hours of lecture per week. Prerequisites: Enrollment in CLAD/Secondary Schools Credential Program. This methods course introduces the theories and concepts of Secondary English. It focuses on the theories for grounding classroom decisions and connects theory and practice. The course models effective approaches to teaching English and introduces issues in the teaching of particular topics. Study English curriculum students gain a foundation for developing plans for lessons and units of instruction as well as a sense of how to build academic communities of diverse learners, involve nonnative speakers of English. (F) Freedman, Cziko

244C. Methods for Teaching English in the Secondary Schools. (3) Three hours of lecture per week. Prerequisites: Enrollment in CLAD/Single Subject English Credential Program and 244B. The second semester of the methods course is designed to continue introducing the teaching of English, with a focus on strategies grounded in an understanding of theories of teaching and learning. Besides considering the English classroom as an educational system, the course focuses special attention on several topics, such as second language learners and the uses of technology in the English classroom. It also explores the uses of portfolio assessment and learning logs for assessing teachers’ growth. By the end of the term, students will have a repertoire of theoretically grounded strategies to use to meet the learning needs of diverse students. (F) Cziko

245A. Approaches in Teaching English as a Second Language, Level 1. (3) Three hours of lecture per week plus field work assignment. Prerequisites: Applied linguistics course or a course in second language acquisition. Formerly 243B. This course is primarily concerned with methods of teaching English as a second language (ESL) to K-12 students and adults. Traditional methods emphasizing the development of structural knowledge and new methods focused on the development of communications skills will be examined. To that end, the course content instruction, “structured English immersion,” syllabus and curriculum design, second language reading, and language testing for placement and evaluation. (FSP) Staff

246A. Teaching Linguistics and Cultural Minority Students. (3) Three hours of lecture per week depending on unit prerequisite. Prerequisites: Admission in a teaching credential program. The objective of this course is to prepare teachers to work with linguistic minority students. We will consider ways in which different groups socialize children for learning and ways in which learning patterns acquired in the home can conflict with the culture of school. Student teachers will consider instructional approaches for working with linguistically and culturally diverse students in their classrooms. Staff

247B. Literacy Practices in Out-of-School Settings. (3) Three hours of seminar per week. This seminar locates and examines literacy sources and practices in out-of-school settings (e.g., homes, churches, community groups, neighborhood-based organizations, clubs, gangs, special interest groups, and the changing settings of the workplace. It also assesses how we facilitate or impede literacy learning in schools. Mahiri

247C. New Literacies of Digital Youth. (3) Three hours of lecture/discussion per week. This course explores new practices of literacy by contemporary youth enabled by digital technologies in places beyond school and home, and how teachers work to enhance or impede literacy and social development in schools. It develops a New Literacy Studies conceptual framework and an ethnography of contemporary literacies; and an examination of semiotic and democratic possibilities. (SP) Mahiri

249C. Foundations in Reading (Learning from Text) for Secondary Schools. (3) Three hours of lecture and one hour of field work per week. Introduction to reading and writing in secondary school settings, basic literacy skills, instructional materials and approaches, and assessment procedures appropriate for use in secondary setting comprehensive. Learning from text-to-text practice. (FSP) Staff

250A. Qualitative Research in Language/Literacy Education. (3) Three hours of lecture per week. Prerequisites: 241A (formerly 244B) or 240A (formerly 245B); or consent of instructor. Formerly 256B. This course introduces the theoretical and methodological frameworks for students working with linguistically and culturally diverse students in their classrooms. Staff

250B. Second Language Acquisition: Concepts and Theories. (3) Three hours of seminar per week. Formerly 253A. Psycholinguistic research on the acquisition of second languages by learners at secondary and post-secondary institutions. How do adults learn languages other than their own in institutional settings? How do they learn from their native languages, and literacy in L1 transfer to the way the L2 is used in its spoken and written forms? Exploration of various hypotheses and theories that consider second language learning from the perspective of: cognitive, and discourse perspective. Topics include inter-language hypothesis; input, transfer and variation in second language acquisition; interlanguage structure; bilingual, multilingual; dialects; Creoles; and language planning. Staff

250C. Discourse Analysis. (3) Three hours of seminar per week. Examination of the major linguistic, psycho- and sociolinguistic concepts and theories of second language and their applications to the analysis of spoken and written texts in education. Topics include coherence and cohesion, deixis, speech acts, genres, systematic of conversation and ritual constraints, discourse semantics and pragmatics, information structure, and narrative structure. Kramsch

250D. Language and Identity. (3) Three hours of lecture/discussion per week. Relationship between language as social practice and the construction of individual and collective identity, and its significance in educational contexts. Beyond language as code, we will consider language as embodied practice; language and subjectivity; pedagogy and symbolic control; language learning as mediated action and as the social symbolic construction of collective identity; authorship and voice; language learning memoirs as acts of identity; the politics of recognition; and linguistic human rights. (SP) Kramsch

252A. Reading Research: Sociocognitive Perspective. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 250B (formerly 242) or consent of instructor. Formerly 252. Critical examination of major theories and approaches to research in reading. Preparation for designing and conducting research projects on the written language. Friedman

252B. The Ethnography of Reading. (3) Three hours of seminar per week. This course approaches reading as a socio-cultural activity and considers recent ethnographic work on reading practices in different educational and cultural contexts. By considering how reading is differently conceived and realized in a wide range of contexts, this course will shed light on reading as a historically contingent, ideologically shaped, and socially organized practice. More specifically, this course has a two-fold aim to: (1) introduce students to recent ethnographic research on reading practices and (2) familiarize them with theories. To this scope, in addition to reading exemplary studies of reading practices, students will also conduct a small-scale ethnographic research project in settings of their choice. (F) Sterponi

253A. Research in Writing. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: 240B (formerly 242) or consent of instructor. Formerly 252. Critical examination of major theories and approaches to research in writing. Prepa- ration for designing and conducting research projects on the written language. Freedman

257. Theoretical Foundations for the Cultural Study of Sport in Education. (3) Three hours of seminar per week. The cultural study of sport examines the cultural institution of sport and its symbolic and ideological embodiment and reflects social meanings and identities. The social practice of sport provides a space in which dominant discourses of race, gender, and social class are reproduced and resisted. As these physical activities become institutionalized, commercialized, and embedded within educational institutions themselves, individuals must navigate a nuanced and often conflicted terrain in their respective participation and performance. This course then examines the role of sport in society broadly and the relationship of sport and education more specifically. The curriculum reviews the writings and research on sport and education from a sociological, psychological, and philosophical perspective, with a particular focus on the constructed divide of mind and body, as manifested in the institutional conflicts between school and sport. (F) Van Rheenen

258. Academic Support Services for Student Athletes. (3) Three hours of lecture/discussion per week. The increased institutionalization and regulation of collegiate athletics have created a new and specialized cadre of personnel whose role is to assist student athletes, academic advisers, learning specialists, tutors, and technological and administrative support staff. This course will investigate the historical, philosophical, and ethical foundation of these services, focusing
263A. Legal Issues in Educational Practice. (1-3)
Two hours of lecture per week. Five weeks per unit. Legal structures and practices in Education for teachers and counselors. Teacher, pupil, counselor rights and responsibilities. Staff

263B. Legal and Policy Issues in Urban Educational Leadership. (3) Three hours of lecture per week. Prerequisites: Admission to the Principal Leadership Institute Program. This course will explore the ways in which urban school policies and decision-making are situated within the larger context of urban systems. The role of the urban school leader in supervising teachers. Tredway

265A. Economics of Education and Other Social Services. (3) Three hours of lecture and one hour of discussion per week. In this course, we will develop the conceptual and methodological tools for assessing the contribution of education to economic growth; demand for education services; education production functions; cost analysis and sectorial planning; and economic aspects of innovation. Grabb

266. The Progressive Tradition in American Education. (3) Three hours of lecture per week. Progressive educators have long sought to center curriculum and pedagogy on the interest and activity of the child, to intervene in community life, and to make schools engines for the democratization of American society. In order to understand today’s efforts to make schools responsive to students’ diverse interests, experiences, and needs, this course examines the sometimes conflicting goals of progressive education, its roots and evolution, and the difficulties in institutionalizing progressive practices in schools. Peristeen

269B. Citizenship, Democracy, and Education Research Group. (3) Course may be repeated for credit. The aim of this group will be to provide institutional and pedagogical feedback on all phases of research and its application to the democratization of education. Topics range, depending on students’ interests, from curriculum and pedagogy to the evolution of social movements for racial justice in education. (F,SP) Peristeen

271B. Introduction to Qualitative Research Methods. (3) Three hours of lecture/discussion per week. Formerly 288B. Introduces principles and methods commonly associated with qualitative research in the social sciences. Includes assigned readings on basic methodological topics; structured activities related to research design, research ethics and human subject protection; and providing feedback on students’ contributions. Fuller

271C. Advanced Topics in Qualitative Research. (3) Three hours of lecture per week. Prerequisites: 271B or equivalent. Formerly 288C. An advanced topic in the theory or practice of interpretive research will be introduced, examined, and applied. Students will conduct a project of qualitative research in a particular area such as moral education, poverty, or everyday learning, or the detailed consideration of an advanced aspect of the logic of interpretive inquiry. (SP) Little

271G. Research Methods in Educational Leadership: Qualitative Methods. (3) Three hours of lecture per week. Prerequisites: Good standing in the LEEP Program. This course introduces future educational leaders to the world of qualitative research so that they may be able to read the research powerfully, intelligently, and learn to design and conduct qualitatively oriented studies themselves. Begivic with an overview of the epistemological assumptions behind the different kinds of research. The course introduces various types of qualitative research approaches and the kinds of topics and queries they support. Students will read and critique examples of published research of various kinds, partially chosen for the interests and inputs of course participants. Next, students will investigate topical developments, the various methods of collecting and analyzing qualitative data, and write the results of their work. (SP) Coburn

272B. School Data Analysis for Principals. (1) Course may be repeated for a maximum of 3 units. One hour of lecture per week. IP graded in the fall; letter graded in spring and summer. Prerequisites: 271F. This course is intended to prepare school principals to conduct data-based inquiry for the purpose of guiding continuous school improvement. To the extent possible, students will learn by analyzing actual school data. The course will review basic techniques of descriptive statistics, concepts of statistical inference, and methods for assessing student performance. Participants will apply these methods to actual assessment procedures and data sets used in California. (F,SP) Staff

273B. Research Group on Policy Implementation. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. This year-long research and writing group is intended for graduate students who plan to specialize in examining educational policy implementation. In the course, we will investigate what happens from the time a policy is enacted until the policy is actually implemented in classrooms, schools, and districts. The centerpiece of the research group is reviewing and providing feedback to members on their works-in-progress related to policy implementation. The goal is to strengthen participants’ abilities to research in this area through a combination of consultation and feedback on specific problems related to conceptualizing and enacting high quality research, including but not limited to the formulation of research questions, theory development, research design, data collection, analysis, writing, and publication. We will supplement this activity by reading research together to help build and strengthen our understanding of the kinds of questions that can potentially inform the study of policy implementation, including institutional theory, social movements analysis, conflict perspectives, and organizational learning theory. (F,SP) Coburn

273C. Decision Making Based on Data Evidence. (3) Three hours of lecture/discussion per week. Formerly Good Standing in LEEP. This course builds on the
premise that data evidence is one of the powerful tools that can help us make informed decisions. The course plans to examine and practice effective and thoughtful use of data for educational improvement at all levels of a school district. Main topics include evaluating policy, programs, and interventions; understanding assessment and key accountability indicators, and how to be a good consumer of research and evaluation. (SP) Newton

274A. Measurement in Education and the Social Sciences I. (4) Four hours of lecture per week. Formerly Educational Psychology 208A. Students will learn good measurement practice by constructing an instrument, assessing its measurement properties (specifically, validity, and reliability). The act of measuring will be positioned as a link between qualitative observations and quantitative measures, and this will be dispersed in a variety of contexts, such as interviewing, standardized testing, and performance assessment. We will discuss both classical and modern testing approaches from conceptual and practical points of view. (F) Wilson

274B. Measurement in Education and the Social Sciences II. (4) Four hours of lecture per week. Prerequisites: 274A or sufficient background to follow the mathematical development. Formerly Educational Psychology 208B. An introduction to classical test theory and item response theory from a theoretical viewpoint. Application of these techniques to a practical measurement situation will be studied. Topics such as test bias, computerized and polytomous response models will be covered. (F) Wilson

274C. Research Seminar in Measurement. (4) Course may be repeated for credit. Four hours of seminar per week. Prerequisites: 274A or equivalent. Formerly Educational Psychology 208C. The seminar will address a current research issue in the area of educational measurement and sociological measurement. Topics will vary from year to year. Some examples are polytomous item response theory, measurement of cognitive processes and learning, and assessment issues in evaluation. (SP) Wilson

274D. Multidimensional Measurement. (4) Four hours of lecture per week. Formerly Educational Psychology 208D. Exploratory factor analysis, confirmatory factor analysis, and multidimensional item response theory. Wilson

275A. Data Analysis in Educational Research I. (4) Four hours of lecture per week. Prerequisites: 293A or 293L or equivalent recommended or consent of instructor. Formerly Educational Psychology 209A. A second course in educational statistics and data analysis. This course is on using and interpreting multiple regression, loglinear models, and the analysis of variance for a variety of data sets and with a variety of analytic objectives. Must be taken concurrently with the second course in Educational 275L.

275B. Hierarchical and Latent Modeling. (3) Two hours of lecture and two hours of laboratory per week. Prerequisites: Linear and logistic regression, 275B or equivalent. The course introduces hierarchical linear and generalized linear models for longitudinal and clustered data. Such models are important in education research where longitudinal development such as learning is of interest and where students are clustered in classes or schools. Other examples of clustered data include data obtained in neighborhoods, hospitals, or firms. Students will practice formulating and estimating hierarchical models using either educational data sets provided or their own data sets. (F,SP) Rabe-Hesketh

275C. Research Group in Multilevel Modeling. (1,2) Course may be repeated for credit. Two hours of lecture per week every other week. Prerequisites: Linear and logistic regression, equivalent to 275B. Multilevel models are useful when the units of observation are grouped in a hierarchy such as students within classes, patients in hospitals, or prisoners in prisons. The research group is for students who wish to analyze such data or who have an interest in the methodology. Students will either discuss ongoing projects or a methodological topic of interest. Readings (papers, chapters, drafts of student projects) will be distributed a week in advance. (F,SP) Rabe-Hesketh

275L. Educational Data Analysis Laboratory II. (1) Two hours of laboratory per week. Prerequisites: 275A and 293L, required. Formerly 209L. Students use the program SYSTAT to do intermediate and advanced data analysis projects using a variety of educational data sets in conjunction with 275B. Assumes basic familiarity with the statistical program SYSTAT. Must be taken concurrently with 275B. Rabe-Hesketh

276A. Introduction to Program Evaluation. (3) Three hours of seminar per week. Formerly 293C. This course provides an introduction to the field of program evaluation. "Programs" might be curriculum innovations, school reorganizations, teacher training reforms, instructional methods innovations, funding programs, or programs in the health or welfare area. It will give an overview of issues of concern to practicing evaluators, researchers, program managers, and academicians interested in field-based research. Those taking the course will be introduced to the history of the field, the basic concepts and intellectual disputes, the major methodological issues, and to some common "models" of how an evaluation ought to be conducted. Based on the understandings of the topics covered, students will participate in designing and constructing an evaluation in their area of personal or professional interests. The purpose of this exercise is for participants to see how framing evaluation questions, designing, and describing an evaluation plan. (F) Newton

276C. Practicum in Evaluation. (2-4) Course may be repeated for credit. Two hours of seminar biweekly, alternating with four-hour laboratories. Prerequisites: 293A or 293L or equivalent. For students involved in an evaluation or assessment project as graduate student researchers or part of a practicum or apprenticeship experience. The purpose of this course is to integrate practical skills evaluation with evaluation and research literatures relevant to specific evaluation questions or methods. Also provides additional instructional support to students using project data in courses, position papers, dissertations. Readings relate to evaluation topics (e.g., evaluation of professional development programs, use of student data to evaluate teaching) and discussions focus on design, methodology, and research questions of specific projects being conducted by the students. Staff

276D. Theoretical Issues in Evaluation. (3) Three hours of seminar per week. Prerequisites: 276A. In this seminar, we will engage in a critical examination of various theoretical perspectives on some of the fundamental issues in evaluation practice: understand why we should care about these issues and what theorists have to say; how theorists’ perspectives reflect their disciplinary training, methodological preferences, and/or their personal evaluation experiences; and the extent to which their theoretical perspectives are or are not connected with evaluation practice. (SP) Newton

276E. Research Design and Methods for Program Evaluation. (3) Three hours of seminar per week. Prerequisites: 276A or consent of instructor. This course, designed to graduate students with some prior training to quantitative research methods, will provide practical experience to enable them to address issues related to "what works" in program and policy evaluation. In addition, the course intends to help students understand the assumptions implicit in each of the approaches. Topics include: (1) validity, threats to validity, and causal inference; (2) randomized experiments and quasi-experiment designs (regression discontinuity and propensity score matching); (3) multilevel modeling techniques for longitudinal and panel data; (4) clinical trial and intervention studies; (5) mixed-methods approaches; (5) meta-analysis for synthesizing evaluation/empirical studies; and (6) power and sample size in designing new evaluation studies. (SP) Newton

277B. Excellence and Equity 2: The Dynamics of Improving Schools and Districts. (3) Three hours of lecture per week. Prerequisites: Good standing in LEAP. The design of this course starts from the assumption that the question of "what works" in schools is not easily answered. Much of it depends on what sorts of outcomes educators value and hinges on conditions set by states, school districts, and schools. The course aims at developing and refining judgment by looking in-depth at improvement strategies, interventions, or levers for change employed by urban school districts. Given that the course structure and content of the course is school and district-specific and, given the administrative and leadership expertise, the course is envisioned as an opportunity for deep reflection and exchange among knowledgeable actors. (F,SP) Mintrop

278C. Milestone 2: Mapping the Professional Knowledge Base. (F) Three hours of lecture per week. Prerequisites: 294E. Good standing in LEAP. This second milestone course picks up on the work from the fall. In the fall, students began to identify a field of interest. This spring, they will identify a field of interest in which they most likely will conduct their research and write their dissertation. Also beginning in the fall, students familiarized themselves with templates for types of dissertations suggested for LEAP students. The second course in the milestone sequence assumes that students have made a selection of a field of interest and are ready to explore its knowledge base. The purpose of the course is to map the exploration forwards and backwards, and to help students prepare for students to take first steps in applying their new knowledge to a dissertation project of a specific type. At the end of the course, students should be ready to pass the first milestone toward dissertation: a focus mapping the professional knowledge base in their field of interest. At a later date, this paper will be submitted as one of three qualifying papers to the oral exam committee. (F,SP) Mintrop, Rodriguez

278D. Milestone 4: Research Design and Methodology. (3) Three hours of lecture per week. Prerequisites: 276C. Good standing in LEAP. The fourth course in the LEAP milestone sequence moves students from the exploration of the professional knowledge base to the dissertation study. This third course will expand on the foundation laid during the second milestone. The main course objective is the completion of milestone 2: the writing of a paper on the design and methodology of the dissertation study. Together with the first milestone paper (Knowledge Base) and the third milestone paper (Dissertation Prospectus), this paper should qualify students to participate in the qualifying exam, the prerequisite for dissertation research. (F,SP) Mintrop

279A. Resource Management 1. (3) Three hours of lecture/discussion per week. Prerequisites: Good standing in LEAP or consent of instructor. This course examines management tools and financial methods of effective leadership of school districts in California. The course will present the fundamental business and educational perspectives and challenge conventional financial management practices in California school systems. Specific areas of emphasis will be on helping students to understand the effectiveness of financial management practices (e.g., financial analyses, budget techniques, cost analyses, management information systems); understanding the constraints that influence public school financial management; and accomplishing the educational objectives of the school system through financial application (cost analysis and project management techniques). The underlying assumption of the course is that informed financial leadership can improve the opportunity to achieve educational achievement and equity in public school organizations. (F) Chan

279B. Resource Management 2. (3) Three hours of lecture/discussion per week. Prerequisites: 279A or consent of instructor. The purpose of this course is to prepare a new generation of superintendents. This course will expand on the foundation laid in the Budgeting 1 class, which serves as a "boot camp" for fundamental financial and leadership concepts used in business and nonprofit organizations. The topics covered will be more focused on developing knowledge and skills needed by superintendents and educational leaders in the present. (SP) Gilford
280A-280B. Proseminar: Sociocultural Critique of Education. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. These interdisciplinary seminars address a series of questions in education. What can philosophically, sociologically, anthropologically, and psychologically informed inquiry be brought to bear on the analysis of learning, on schooling processes, and more generally on what do we mean by critical and interpretive theories, and what are their relations with social practice? How can education come to constitute itself otherwise than in its current form? Leonardo Hurst.

280C. Research Apprenticeship and Qualitative Methodology Seminar. Three hours of lecture per week. Prerequisites: 280A or consent of instructor. The emphasis in this course is on the practice of research. Each student, ordinarily in the second year of graduate study, develops a research project with a faculty mentor and carries it out under direction. At the same time, students work together in this seminar. Short written assignments during the first eight weeks result in a research proposal to be carried out by the end of the semester. Students spend about 50 hours on the field research. Shaiken.

280D. Research Apprenticeship and Qualitative Methodology Seminar II. (3) Three hours of seminar per week. Prerequisites: 280C or consent of instructor. This seminar is the second in a sequence of courses on the practice of research. In the first semester students work with faculty mentors and in the seminar to carry out a field research project. Continuing both apprenticeships and this seminar, this semester is devoted to analyzing the field materials and preparing a paper on the research. Shaiken.

283B. Historical Perspectives on American Education. (3) Three hours of lecture per week. Public schooling today reflects a long evolution, producing an institutional form that embodies social inequalities as well as democratic aspirations. Politicians, teachers, school reformers, and others interested in education invoke elements of this history to justify their efforts. This course explores multiple aspects of the history of schooling, including institutions and culture, and practices of American schools to broader social, economic, political, and intellectual developments. (SP) Perstein.

283C. The African American Tradition of Critical Educational Thought and Practice. (3) Three hours of seminar per week. Prerequisites: Consent of instructor. Educational projects of asserting and reconstructing African American humanity, of claiming a place in a building separate and apart, and institutions and culture have been central concerns of Black intellectuals. While this course surveys the history of African American education and the evolving forms of white supremacy in schooling, it is primarily an engagement with those who are the architects of African American thought and culture. African American scholars and students; systemic issues in educational improvement and the perpetuation of “achievement gaps”; and language and power. Also listed as African American Studies C286. (SP) Suad-Bakari.

287. Race, Gender, and Immigration: Citizenship and Education. (3) Three hours of seminar per week. U.S. citizenship has been defined in racialized and gendered terms since the nation’s founding. This course explores how these definitions have affected the historical development of U.S. public schooling, particularly the unequal educational opportunities available to racial minorities and women, and how they have affected American approaches to civic education. (SP) Garcia Bedolla.

288. Intersectionality in Education Research. (3) Three hours of seminar per week. This course is designed to explore the theoretical and methodological questions raised by the concept of intersectionality in the education of African American children and adolescents in the United States. Readings will support students in understanding some of the key issues and tensions in African American education and school achievement, including the roles that culture, identity, and power play in the education and schooling of African American students; systemic issues in educational improvement and the perpetuation of “achievement gaps”; and language and power. Also listed as African American Studies C286. (SP) Suad-Bakari.

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294C. Seminar on Formulation of Educational Research. (1-4) Course may be repeated once for credit. One to four hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Education in Mathematics, Science, and Technology 294A. Review of criteria for useful educational research. Emphasis is on applying these criteria while developing a course in research on topics of interest to the participants. Staff

294E. Thesis Seminar. (1-4) Course may be repeated for credit. Three hours of discussion per unit per week. Prerequisites: Good standing in the LEEP. Formerly Educational Psychology 294E. Recommended for M.A. students. A writing seminar on papers or theses and doctoral students preparing dissertation proposals. (F,SP) Staff

295B. Technology, Curriculum, and Instruction. (3) Three hours of seminar per week. Formerly Education in Mathematics, Science, and Technology 291B. To explore the cognitive consequences of technology in instruction and learning, the promise of technology in education will be examined, and exemplary instructional software will be explored. A model of knowledge acquisition and knowledge change incorporating technological delivery of instruction will be developed. Linn

295C. Integrating Technology into Secondary English Instruction. (4) Three and one-half hours of lecture and one and one-half hours of laboratory per week. Prerequisites: Admission into the MUSE Credential/MA Program. This course will cover: (1) basic skills in using computer hardware and software; (2) knowledge of the legal and ethical issues surrounding the use of computers in the classroom; (3) communicating through a variety of electronic media; (4) designing, adapting, and using lessons to promote information literacy for lifelong learning; (5) optimizing lesson plans based upon the technological resources available in the classroom or school setting; and (6) contributing to planning the use of technological resources in the school setting. (SP) Staff

298A. Group Study for Graduate Students—POME. (1-5) Course may be repeated for credit. One to five hours of lecture/seminar per week. Formerly Education in Mathematics, Science, and Technology 298A. To explore the cognitive consequences of technology in instruction and learning, the promise of technology in education will be examined, and exemplary instructional software will be explored. A model of knowledge acquisition and knowledge change incorporating technological delivery of instruction will be developed. Linn

298B. Group Study for Graduate Students—LLSC. (1-3) One hour of lecture/seminar per week per unit. Section 1 to be graded on a letter-grade basis. All other sections to be graded on a satisfactory/unsatisfactory basis. Consent of instructor. Formerly Education in Language and Literacy 298B. Research on special problems and topics not covered by courses or seminars. Topics will vary in different semesters. Staff

298C. Group Studies, Seminars, or Group Research—DCEMST. (1-4) One to four hours of lecture/seminar per week. Formerly Education in Mathematics, Science, and Technology 298C. Advanced group study in education. Topics vary from semester to semester. May consist of organized lectures or seminars or be self-directed in collaboration with a mentor from the research area in which the group is working. (F,SP) Staff

298D. Group Study for Graduate Students—SCS. (1-3) One to three hours of lecture/seminar per week. Formerly Social and Cultural Studies in Education 298D. Recurring topics and topics not covered by courses or seminars. Staff

298E. Group Study and Research. (1-6) One to six hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Educational Psychology 298E. Group study and research on special problems and topics. (SP) Staff

299. Special Study and Research. (1-12) Course may be repeated for credit. Individual conference and independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Special study or research under direction of a faculty member. 1 unit of credit for every four hours of conference and independent research time per week. Staff

301. Individual Study for Master’s Students. (1-8) Course may be repeated for a maximum of 16 units. Course does not satisfy unit or residence requirements for master’s degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study for the master’s examination in consultation with a faculty adviser. 1 unit of credit for each four hours of conference and independent research per week. Staff

302. Individual Study for Doctoral Students. (1-8) Course may be repeated for a maximum of 16 units. Course does not satisfy unit or residence requirements for doctor’s degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study in preparation for the doctoral qualifying examination. 1 unit of credit for each four hours of conference and independent research per week. Staff

Professional Courses

380. Teaching Assistants Practicum. (1-6) Course may be repeated for credit. One half-hour lecture, one one-quarter hour discussion and one hour fieldwork per unit per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Staff

390A-390B. Supervised Teaching for Secondary English. (7,8) Prerequisites: Admission to a teaching credential program. Twenty-four to 28 hours of supervised teaching in public school classrooms and 20 hours or one hour of fieldwork per week. Sequence begins with the fall semester. (F,SP) Czikó

390C. Supervised Teaching in Elementary Education. (1,4) Course may be repeated for credit. One to two hours of lecture and two to ten hours of fieldwork per week. Prerequisites: Admission to a teaching credential program. Formerly Educational Psychology 390C. Fieldwork for teaching credential. Supervised teaching may begin with the opening of the public schools in the fall and extend through the spring semester. Salasín

390D. Supervised Teaching in Mathematics and Science for Secondary Schools. (2-6) Course may be repeated for credit. Two hours of lecture and two to 10 hours of fieldwork per week. Prerequisites: Admis- sion to a teaching credential program. Formerly Education in Mathematics, Science, and Technology 390D. Fieldwork for teaching credential. Supervised teaching may begin with the opening of the public schools in the fall and extend through the spring semester. Zimmerlin

391A. Technology, Curriculum, and Instruction. (1) One hour of seminar and two hours of laboratory per week. Prerequisites: Admission to the Developmental Teacher Education Program. Meets level 1 technology for the California Multiple Subject Credential. This second part will focus on application and extensions of classroom technology. (SP) Levenson, Salasín

391B. Technology, Curriculum, and Instruction II. (1) One hour of seminar and two hours of laboratory per week. Prerequisites: 391A. Part 2 of a two-part sequence meeting technology requirements for Cali- fornia Multiple Subject Credential. This second part will focus on application and extensions of classroom technology. (SP) Levenson, Salasín

392C. Arts in the Elementary Classroom. (1) Course may be repeated for credit. Must be taken on a satisfac- tory/unsatisfactory basis. Formerly Educational Psychology 292C. Introduction to basic computer skills and appli- cations. (F) Salasín

393. Preparation for Completion of the Elementary Mathematics Performance Assessment. (1) One and one-half hours of lecture and two hours of fieldwork per week. Formerly Education in Mathematics, Science, and Technology 294A. Discussion of criteria for useful educational research. Emphasis is on applying these criteria while developing a course in research on topics of interest to the participants. Staff

413A-413B. Community-Based Internship in School Psychology. (7,7) Course may be repeated for credit. Three hours of lecture, discussion, and six hours of fieldwork per week. Supervised assignment to a community mental health agency in the capacity of school psychologist. Staff

413C-413D. School-Based Internship in School Psychology. (6,6) Course may be repeated for credit. Two hours of lecture and eight hours of fieldwork per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Must be taken concurrently with 213C-213D and 413C-413D. Staff

460A. Practicum in School Site Management I. (3) Three hours of lecture and fieldwork per week. Prerequisites: Admission to Administrative Services Credential program. Supervised field experience, conferences, and colloquium. Staff

460B. Practicum in School Site Management II. (1,2) Course may be repeated for credit. Three to six hours of fieldwork per week. Prerequisites: 460B. Supervised field experience, conferences, and colloquium. (SP) Staff

460C. Research Practicum in Administration. (2) One hour of lecture and three hours of fieldwork per week. Prerequisites: 294A and admission to the Principal Credential Program. Engages master’s students in collecting and analyzing data on efforts to improve educational practices or solve impor- tant problems in school systems. (SP) Tredway

470D. Advanced Residency in Educational Leadership. (3) Course may be repeated for credit. One hour of seminar per week, six hours of residency in a local school district and two hours of individual research preparation. Prerequisites: 470A-470B-470C and good standing in the Joint Doctoral Program. Stu- dents will meet weekly for one hour with a residency adviser at one of the following campuses: San Fran- cisco State University; California State University, East Bay; or San Jose State University. The residency will require six hours of independent study in a school district site to expand their research on systemic educational reform; curriculum, instruction, assessment, and profes- sional development; or budgeting, resource allo- cation, and financial operations. The specific topics will be selected by the students in conjunction with their faculty counselors and residency advisers in collab- oration with the district consultant. An additional two hours weekly will be dedicated to preparation of residency study materials for the residency assignment. Students will be expected to present the results of their residency research to the faculty and students of the Joint Doctoral Program. (F,SP) Staff

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Overview

The Department of Electrical Engineering and Computer Sciences (EECS) offers one of the strongest research and instructional programs in this field anywhere in the world. Our key strength is in cross-disciplinary team-driven projects. The interaction between electrical engineering (EE), computer science (CS), and computer engineering (CE) forms the core, with strong interactions that extend into biological sciences, mechanical and civil engineering, physical sciences, chemistry, mathematics, and operations research. Our programs have been consistently ranked in the top three nationwide and worldwide by various organizations that rank academic programs.

Each year, top students from all parts of the world are attracted to Berkeley by the excellence of the faculty, the breadth of educational opportunities in EECS and campuswide, the proximity to the vibrant California high-tech economy, and the Berkeley environment. The department’s close ties to industry, coupled to its commitment to engineering research and education, ensure that students get a rigorous, relevant, and broad education.

Faculty members at Berkeley are committed to research and discovery at the highest level, informed and creative teaching, and the creative desire to excel. The distinction of the EECS faculty and students has been recognized in a long list of prestigious honors and awards, including two National Medals of Science, three ACM Turing Awards, three IEEE Medals of Honor, 36 members of the National Academy of Engineering, seven members of the National Academy of Sciences, 14 fellows of the American Academy of Arts and Sciences, etc.

Unlike many institutions of similar stature, regular faculty teaches the vast majority of our courses, and the most exceptional teachers are often also the most exceptional researchers. The department’s list of active teaching faculty includes seven winners of the prestigious Berkeley Campus Distinguished Teaching Award.

The mission of the Department of Electrical Engineering and Computer Sciences has three parts:

1. educating future leaders in academia, government, industry, and entrepreneurial pursuits, through a rigorous curriculum of theory and application that develops the ability to solve problems, individually and in teams;
2. creating knowledge of fundamental principles and innovative technologies, through research with our leading faculty in areas of EECS and in collaboration with other disciplines, that is distinguished by its impact on academia, industry, and society; and
3. serving the communities to which we belong, at local, national, and international levels, with a deep awareness of our ethical responsibilities to our profession and to society.

Our strategy to accomplish this mission is simple: recruit and retain the very best faculty, students, and staff, and then empower them to direct and drive the creation and dissemination of knowledge. We know that we have succeeded in this mission when our students succeed, becoming leaders and serving society.

Electrical engineering began on the Berkeley cam- pus more than a century ago, with the hiring of the first electrical engineer, Clarence Cory, into the College of Mechanics. The early days focused on electrical engineering and distribution, and Cory’s laboratory, in fact, provided the first light and power to the entire campus.

The evolution since then has been dramatic, accelerating rapidly in the latter half of the 20th cen- tury. The development of our world-class computer science faculty to focus on the synergy of the inter- actions between electronics, systems theory, and computing. In the 21st century, EECS has become a broader field, defined more by its intellectual approach to engineering problems than by partic- ular technical solutions. Broadly, EECS harnesses physical processes to perform logical functions, and hence easily extends beyond its core tech- nology base in electronics to, for example, bio- logical systems.

Current strengths in biosystems and computational biology, nanotechnology, artificial intelligence, concurrent and distributed systems, embedded systems, novel devices (such as organic semi- conductors), robotics, advanced networking, com- puter security and trusted computing, energy, and sensor networks complement beautifully our tra- ditional strengths in physical electronics, integrated circuits, computer architecture, control theory, signal processing, the theory of comput- ing, programming languages, scientific computing, electronic design automation, power systems, and database management systems. Many of our current research projects are focused on enor- mous societal challenges and opportunities such as energy efficiency, network intelligence, trans- portation systems, security, and health care. More than any other engineering discipline, EECS bridges that boundary between science and one, creating technologies to serve humanity.

Organizationally, EECS smoothly integrates its world-class faculty with dedicated staff and extremely active and involved student groups. Our undergraduate programs recognize the daunting but tantalizing breadth of the field by offering a great deal of flexibility. These programs are accredited by ABET, Inc., 111 Market Place, Suite 1050, Balti- more, MD 21202-4012, (410) 347-7700; and by the CAC, the Computing Accreditation Commis- sion of ABET, Inc.

Our graduate programs emphasize research, preparing students for leadership positions in industrial labs, government, or academia. Our lab- oratory and computing facilities are among the best anywhere, and have conceived many trans- formative inventions. Our research programs are well funded, and nearly all of our graduate stu- dents receive full financial support.

See the College of Engineering Announcement: A Guide to Undergraduate Study at coe.berkeley.edu/college-of-engineering- announcement for more information.

Undergraduate Programs

Under the auspices of the College of Engineer- ing, EECS offers two undergraduate programs: Electrical and Computer Engineering (ECE) and Computer Science and Engineering (CSE). The ECE program emphasizes on com- puter science, whereas the ECE program puts a greater emphasis on electrical engineering. Both programs require the same set of lower- division courses

AC suffix=course satisfies Academic Cultures requirement

W prefix=online course
†Recipient of Distinguished Teaching Award

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

and science courses. After satisfying program requirements at the lower division level, students are free to choose from a variety of elective upper division courses and hence easily extend beyond their coherent choice of courses, we ask students to choose from one of five “options.” The choice of option affects the assignment of a faculty adviser, and the options provide sample programs that suggest reason- able tracks.

The options are:

Physical Electronics (Option 1): For students interested in integrated circuits, electronic devices, nanotechnology, electromagnetics, nano- and nano-fabrication, photonics and optoelectronics, microelectromechanical systems (MEMS), elec- tronics, and power systems. Requires a broad base in electronics, and power to the entire campus.

Communication, Networks, and Systems (Option II): For students interested in networks, control systems, digital and analog communica- tions, information theory, signal processing, and systems modeling, design, verification, and opti- mization, together with applications to robotics, biomedicine, wireless communications systems, multi-media systems, multi-sensor fusion, and machine intelligence.

Computer Systems (Option III): For students interested in computer architecture and logic design, communication networks, computer security, oper- ating systems, database systems, programming languages, embedded software, and/or digital devices and circuits, together with applications to networked computing, embed- ded systems, computer games, and informa- tion systems.

Computer Science (Option IV): For students interested in the foundations of computing, which includes the theory of computation, analysis of algorithms, complexity theory, the architec- ture and logic design of computers, program- ming languages, compilers, operating systems, scientific computation, computer graphics, database systems, artificial intelligence and nat- ural language processing, and cryptography and computer security.

General Course of Study (Option V): Enables students whose interests are broad or who have focused on a specific area to choose one of five “options” in the areas mentioned above.

Students in the CSE program typically select options I, II, III, or V, whereas students in the CSE program typically select options III or IV. Students are not obliged to follow any of these options pre- cisely, but are free to plan an individual program to suit their special needs or interests, subject to meeting the requirements detailed below.

Diplomas received by students in both the ECE and CSE program state that the students received a Bachelor of Science from the University of Cali- fornia, Berkeley College of Engineering. The diploma does not indicate the option or the CSE program. The student’s transcript indicates whether the program was ECE or CSE.

Curriculum and Requirements for the Bachelor’s Degree

Students must complete a minimum of 120 units, in which they must satisfy the University of Cali- fornia, Berkeley core outline outlined in this catalog. In addition, students must complete the requirements for the College of Engineering. Full details on these requirements can be found in the College of Engineering Undergraduate Program. A Guide to Undergraduate and Graduate Study avail- able at coe.berkeley.edu/college-of-engineering- announcement and the “EECS Undergraduate Notes” at eecs.berkeley.edu/Programs/Notes/
Computing Service Courses

Students may earn a total of at most 5 units of credit toward graduation for courses labeled as “computing service” courses, which include CS 3, 3L, 3S; the CS 9 courses; and Engineering 110. Students will receive no more than 1 unit of credit for each computing science course taken after the first or after any of the CS 61 courses. Any units beyond these limits will not count toward graduation, although they will count for the sole purpose of determining whether the study list falls within the minimum and maximum unit loads.

Course Materials Fee

The Department of Electrical Engineering and Computer Sciences charges a course materials fee for Electrical Engineering 143. The amount of the fee is listed in the online Schedule of Classes.

Advanced Degree Programs

The Five-Year Bachelor/Master’s Program in EECS (B.A./M.S. or B.S./M.S.): The combined bachelor/master’s program is designed to take outstanding EECS and CS L&S undergraduates immediately into the two-semester program conferring the Master of Science degree. This combined program promotes interdisciplinary focus and is best suited to those who are more experienced and are looking to pursue a Master degree, and for those wishing to pursue a more traditional research-based, and discipline-specialized advanced course of study. As such, a distinguishing feature of this five-year program is its emphasis upon extended studies in interdisciplinary, technical fields such as physics, biology, and statistics, or in professional disciplines such as business, law, or public policy. The program is aptly entitled, “Educating Leaders for the Emerging Global Economy,” and reflects a growing need for those who are technically skilled and also possess an understanding of the business, legal, and social context of technology development and use.

Conferral of the degree requires either writing a thesis (Plan I) or reporting on a project (Plan II), as is required of our other master’s students.

Complete information is available at eecs.berkeley.edu/FiveYearMS.

Graduate Programs

The EECS Graduate Program offers a comprehensive program geared toward research and teaching (Master of Science and Doctor of Philosophy). The Master of Science Program requires three to four semesters of study. The Doctor of Philosophy Program is normally completed in five to six years. Admission into the graduate program is extremely competitive, but once admitted, students have a wide variety of cluster areas from which to choose an affiliation, and a large number of courses and seminars taught by leaders in their fields from which to design their study programs. Students apply to either the Electrical Engineering Division or to the Computer Science Division, although once they have been admitted to the department, the boundaries between the divisions are fluid. Students in the division most appropriate to their principal area of interest.

Students whose principal interests are in the following areas should apply to Electrical Engineering:

**Communications and Networking:** Includes information theory and coding (multiterminal problems, feedback, adversarial models, separation theorems and layering, low density parity check codes, VLSI implementation of codes, algorithms for decoding, message passing algorithms), wireless and sensor networks (ad-hoc, mobile and vehicular networks, multiple antennas, opportunistic communication, cognitive radio and spectrum sharing, distributed source coding, distributed estimation, spatial sampling), network design and analysis (optical networking, market-based architectures, channel assignment, light paths, electronic switching, code division, peer-to-peer networks, quality of service, communication for control, cross-layer optimization, network coding, and simulation tools, secure wired and wireless networks, network security, network science, market based approaches, authentication).

**Control, Intelligent Systems, and Robotics.** Concerned with the general problem of modeling systems and machines, and then making them responsive appropriately to inputs. Optimization and mathematical techniques play a key role, especially as systems of interest grow in scale. Control ranges from applications in semiconductor process control to hybrid and networked control to nonlinear and learning control, and includes interactions with faculty in mechanical engineering and integrative biology, as well as between electrical engineering and computer sciences.

Robots are interpreted to include mobile autonomous systems from millimeter-sized mobile robots to three-meter rotor span helicopters, fixed autonomous systems for assembly as well as human augmentation or virtual and represence and virtual reality. Providing robots with image understanding capabilities is one of the key research areas, as well as using computer vision to assist humans.

**Design of Electronic Systems:** Includes electronic instrumentation, microelectronics, biosystems, computing, consumer electronics, instrumentation, medical systems, signal processing, ubiquitous electronics, and wireless communications, circuit design (high-speed digital and high-frequency analog circuits, microwave circuits, memories, nanoscale analog circuits, precision measurement, timing, voltages and currents, robust circuit design, and VLSI architecture), digital signal processing (bio/silicon interfaces, mixed signal systems, mixed material systems, and microelectromechanical systems), and energy management (high-power meters, power management for mobile systems). Energy issues in scaling device technology to low cost devices, and pricing policy and economic models.

**Integrated Circuits:** Includes applications (analog-to-digital and digital-to-analog conversion, auto-motive electronics, biosystems, computation, consumer electronics, instrumentation, medical systems, signal processing, ubiquitous electronics, and wireless communications), circuit design (high-speed digital and high-frequency analog circuits, microwave circuits, memories, nanoscale analog circuits, precision measurement, timing, voltages and currents, robust circuit design, and VLSI architecture), digital signal processing (bio/silicon interfaces, mixed signal systems, mixed material systems, and microelectromechanical systems), and energy management (high-power meters, power management for mobile systems). Energy issues in scaling device technology to low cost devices, and pricing policy and economic models.

**Microelectromechanical Systems (MEMS):** Includes microelectromechanical systems (electronic and biomedical applications, micro-robotics, resonators, sensors and actuators, and silicon structures), nanotechnology (carbon nanotubes, nanowires, molecular-scale structures, quantum dots, and biological materials), and optoelectronics (lasers, light emitting diodes and detectors, optical tweezers, optical communication, and solar cells).

**Physical Electronics:** Includes magnetooptics (high frequency integrated circuit design, simulation, waveguides, and wireless channels), electronics (integrated circuits, high-speed digital electronics, semiconductor technologies, and superconductive devices), micro/nano fabrication (fabrication technologies for semiconductor, electromagnetic, photonics, and other electronic and nanometer-scale systems, advanced processing modules, integration of heterogeneous systems, process modeling and simulation, lithography, and advanced metrology and manufacturing systems).
Signal Processing: Includes theory and algorithms (adaptive signal processing, machine learning, and signal modeling; indexing, searching, and retrieval of multimedia; multi-channel processing; restoration and enhancement; signal analysis, identification, spectral estimation, and understanding; signal representation, compression, coding, quantization, and sampling; statistical signal processing, detection, estimation, and classification; watermarking, encryption, and data hiding; wavelets, filters, banks, time frequency techniques), signal processing applications (audio, speech, image, and video processing; graphics; biological and biomedical signals; computer vision; radar and lidar; geophysical signals; synthetic signals; and astronomical signals), signal processing systems (VLSI architectures), embedded and real-time software; capture, acquisition, and sensing; sensor networks; imaging; and auditory enhancement.

Students whose principal interests are in the following areas should apply to computer science:

Artificial Intelligence: Includes knowledge representation and reasoning (logical and probabilistic formalisms and combinations thereof), machine learning and probabilistic inference (graphical models and statistical and computational learning theory), decision making (problem solving search, planning, and decision process planning and reinforcement learning), search and information retrieval (collaborative filtering, information extraction, image and video search, intelligent information systems), natural language processing (parsing, machine translation, information extraction), speech recognition, computer vision, and robotics.

Computer Architecture and Engineering: Includes processor and system design (multithreading; computer architecture; parallel and multithreaded processing), domain-specific architectures, reconfigurable computing, memory hierarchies, performance analysis (theoretical analysis, simulation, and emulation hardware and compiler techniques for parallel and VLSI implementations), compiler technology, network interfaces, storage systems, and quantum computing architectures.

Database Management Systems: Includes scalable data acquisition (sensor tasking, sampling), data integration and cleaning (federated databases, deep web, structure induction, anomaly detection), query processing and search (structured data, text and web repositories, information extraction, data streams), distributed data management (copying, machine translation, information extraction), speech recognition, computer vision, and robotics.

Graphics: Includes geometric modeling (splines, subdivision surfaces, rapid prototyping, computer aided design, and surface optimization), rendering (real-time rendering, global illumination, Monte Carlo rendering), image-based rendering, inverse rendering, and vision-simulation, fluid simulation, video games), imaging (computational photography and video and video, texture synthesis, appearance acquisition).

Human-Computer Interaction: Includes visualization (multidimensional visualization, cartographic visualization, 3-D visualization, graphical perception, collaborative analysis), context-aware computing, sensor networks, and sensor-aware systems, privacy technologies, perceptual interfaces (vision-based interfaces, speech and discourse interfaces), and collaboration and learning (pattern-based authoring tools, English as a second language learning, group collaboration technologies).

Operating Systems and Networking: Includes Internet architecture (overlay architectures, distributed hashing, naming, next generation network design, peer to peer networking, mobile and ad-hoc networking), security (malware detection, secure routing, testbeds for security, operating systems security, intrusion detection, availability, and authentication), distributed systems (experimental testbeds, distributed logging, distributed software systems, time synchronization), operating systems (OS for sensor networks, monitoring and OS behavior for malware, detection, performance analysis, programming languages for systems, and power aware computing), network economics (price of anarchy, game theory), and technology for developing regions.

Programming Systems: Includes programming language design and implementation (compiler optimization, semantics), programming environments and tools (monitoring, debugging), program analysis and verification (model checking, static analysis, theorem proving), and software design and synthesis (software design for parallel computing, embedded systems, numerical computing, symbolic computing, and distributed computing).

Scientific Computing: Includes parallel computing (parallel high speed libraries, architectures), computer arithmetic (mathematical computation, mesh generation, matrix computing (language design for scientific computing, algorithms for memory and cache optimization for numerical linear algebra, computer algebra, grid-based computing), extended precision arithmetic, redundant arithmetic), numerical methods (extended precision arithmetic, reliable floating-point standards, architectural and runtime implementations of floating-point standards, programming language implications of floating-point standards), and animation (simulation and visualization of physical processes).

Security and Privacy: Spans the development of mechanisms and systems designed for operation in the presence of adversaries who either seek to subvert the correct operation of the system, misuse its capabilities, or unduly extract information from it. Includes work in the context of software, languages, operating systems, networking, distributed/mobile/embedded systems, malware analysis and defense, usability, human factors, anonymity, threat evolution, economic and legal issues, and their relationships.

Theory: Includes computational complexity (intractability, complexity classes, completeness, approximability, randomness), parallel and distributed computation, design and analysis of algorithms (including Monte-Carlo algorithms, optimization algorithms), quantum computation, computational learning theory, computational geometry, computational biology, cryptography, and logic and concurrency theory.

Students with interests in the following areas can apply to either division:

Biosystems: Includes systems neuroscience (sensor motor control, vision, audition, biomimetics, brain-machine interfaces, and computational neuroscience), biological systems (sensors, healthcare systems, physiological modeling, medical imaging, and computational biology), cellular systems (protein structure modeling, gene regulatory networks; synthetic biology; computational systems biology; cellular signaling pathways, transport, and metabolism; and self-assembling systems), and bioinformatics (comparative genomics, genetic analysis, phylogenetics, molecular evolutionary modeling, and gene regulatory networks).

Education: Includes aspects of computer science (society and culture, teaching and learning [especially at the high school and undergraduate levels], gender issues of science education, and the teaching of technology).
Berkeley. The program focuses on the set of management activities associated with bringing high-tech products to market. It is the most popular interdisciplinary program at Berkeley, with classes and fellowship programs made up of roughly an equal number of Haas MBAs and School of Information and EECS M.S. and Ph.D. students. The M.O.T. Certificate is designed for graduate students who want to specialize in the management of technology as they obtain their degrees.

Electrical Engineering

Lower Division Courses

20N. Structure and Interpretation of Systems and Signals. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Mathematics 1B and Physics 7B. Fundamental circuit concepts and analysis techniques in the context of digital electronic circuits. Transient analysis of CMOS logic gates; basic integrated-circuit models. Operation of digital electronic circuits. Four hours of lecture and one hour of discussion per week. (F,SP) Staff

42. Introduction to Digital Electronics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 1B. This course serves as an introduction to the fundamental principles of electrical engineering, starting from the basic concepts of voltage and current and circuit elements of resistors, capacitors, and inductors. Circuit analysis is taught using Kirchoff’s voltage and current laws with capacitors, and inductors. Digital logic gates and design using CMOS as well as simple flip-flops are introduced. Speed and scaling issues for systems, including logic circuits, amplifiers, power supplies, and communication links. (F,SP) Staff

105. Microelectronic Devices and Circuits. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 40. This course covers the fundamentals of digital electronics. CMOS inverters and their realization using single stage and multistage CMOS building blocks are discussed. Sinusoidal carrier communication concepts and the steady-state analysis techniques of phasor analysis are developed, including impedance and the magnitude and phase response of linear circuits. The frequency responses of single- and multi-stage amplifiers are presented. Differential amplifiers are introduced. (F,SP) Staff

117. Electromagnetic Fields and Waves. (4) Three hours of lecture, one hour of discussion, and one and one-half hours of laboratory per week. Prerequisites: Mathematics 41 and one of Physics C11, Physics C12, Physics C14, or Physics C15. Review of static electric and magnetic fields and applications; Maxwell’s equations; transmission lines; propagation and reflection of plane waves; introduction to guided waves, microwave networks, and radiation and antennas. Mini-labs on statics, transmission lines, and waves. (F,SP) Staff

119. Introduction to Optical Engineering. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7C. Fundamental principles of optical systems. Geometrical optics and aberration theory. Huygens principle, thin lenses, spherical aberration, diffraction and interference. Optical materials and coatings, holography, interferometry, laser optical devices and the human eye. The design of optical systems. Lasers, fiber optics, and holography. (SP) Staff


121. Introduction to Digital Communication Systems. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 120, 126. Introduction to the fundamental principles of the design and analysis of modern digital communication systems. Topics include source coding, channel coding, baseband and passband modulation techniques, receiver design, and channel equalization. Applications to telephones, digital telegraphy, mobile telephones, compressors, and digital wireless communication systems. Concepts illustrated by a sequence of MATLAB exercises. (SP) Staff

122. Introduction to Communication Networks. (4) Three hours of lecture, one hour of discussion, and one hour of laboratory per week. Prerequisites: Computer Science 61B; Mathematics 53 or 54. This course is an introduction to the design and implementation of computer networks. We will focus on the concepts and fundamental design principles that have contributed to the Internet’s scalability and robustness and survey the underlying technologies—e.g., Ethernet, 802.11, DSL, optical links—that have led to the Internet’s phenomenal success. Topics include layering, congestion/flaw/error control, routing, addressing, multicast, packet scheduling, switching, internetworking, network security, and networking programmability. (SP) Staff

123. Digital Signal Processing. (4) Three hours of lecture, one hour of discussion, and one hour of laboratory per week. Prerequisites: 120. Discrete time signals and systems: Fourier and Z transforms, DFT, DCT. Digital signal processing topics: fast Fourier transforms, FFT, chirp-z algorithms, Hilbert transform relations, quantization effects, linear prediction. Digital filter design methods: windowing, frequency sampling, S-to-Z methods, frequency-transformation methods, optimization methods, 2-D filter design. (SP) Staff

C125. Introduction to Robotics. (4) Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: 120 or equivalent, consent of instructor. An introduction to the kinematics, dynamics, and control of robot manipulators, robotic vision, and sensing. The course covers forward and inverse kinematics of serial chain manipulators, the manipulator Jacobian, force relations, dynamics, and control. It presents elementary principles on proximity, tactile, and force sensing, vision sensors, camera calibration, stereo construction, and motion detection. The course concludes with current applications of robotics in active perception, medical robotics, and other areas. Also listed as Bioengineering C125. (F) Bajcsy

126. Probability and Random Processes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20. Fundamentals of probability and random processes. Topics include random variables, distribution functions, random vectors. Law of large numbers. Central limit theorem, Estimation and detection. Markov chains. (F,SP) Staff

127A. Optimization Models in Engineering. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Math 54. Optimization models in engineering. Linear, quadratic convex, and second-order cone optimization. Applications in engineering, circuit design, optimal control, signal processing, finance, operations research, machine learning, computer science, bio-engineering. (SP) El-Ghaoui

C128. Feedback Control Systems. (4) Three hours of lecture and one hour of discussion per week. Analysis and synthesis of linear feedback control systems in time and frequency domains. Control system design by root locus, frequency response, and state space methods. Applications to electromechanical and mechatronics systems. Also listed as Mechanical Engineering C134. (F,SP) Staff
129. Neural and Nonlinear Information Processing. (3) Three hours of lecture per week. Prerequisites: 120 or consent of instructor. Principles of massively parallel real-time computation, optimization, and information processing via nonlinear dynamics and analog VLSI neural networks, applications selected from image processing, pattern recognition, feature extraction, motion detection, data compression, secure communication, bionic eye, auto waves, and Turing patterns. (SP) Chu

130. Integrated-Circuit Devices. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 40 or 105. Overview of electronic properties of semiconductors and behavior of microelectronic devices and devices with tunable, bipolar transistors, and MOS field-effect transistors. Properties that are significant to device operation for integrated circuits. Silicon device fabrication technology. (FSP) Staff

140. Linear and Nonlinear Circuits. (4) Three hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: 105. Single and multiple stage transistor amplifiers. Operational amplifiers. Feedback amplifiers, 2-port formulation, source, load, and feedback network loading. Frequency response of cascaded amplifiers, gain-bandwidth exchange, compensation, dominant pole techniques, root locus. Supply and temperature independent biasing and reference techniques. Applications of analog circuits in analog-to-digital conversion, switched capacitor filters, and comparators. Laboratory builds on the concepts presented in the lectures and provides hands-on design experience and help with the use of computer aided design tools such as SPICE. (FSP) Staff

141. Introduction to Digital Integrated Circuits. (4) Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: 40; 105 and 150 or equivalent. CMOS devices and deep sub-micron manufacturing technology. CMOS inverters and complex gates. Modeling of interconnect wires. Optimization of designs with respect to a number of metrics: area, speed, power, performance, and design for dissipation. Sequential circuits, timing considerations, and clocking approaches. Design of large system blocks, including arithmetic, interconnect, memories, and finite state machines. Introductory digital system designs and complex digital systems, including hands-on experience. (FSP) Ailon, Rabaei

142. Integrated Circuits for Communications. (4) Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: 20 and 140. Analysis and design of electronic circuits for communication systems, with an emphasis on integrated circuits for wireless communication systems. Analysis and design of amplifiers for application to radio receiver design. Power amplifier design with application to wireless radio transmitters. Radio-frequency mixers, oscillators, phase-locked loops, modulators, and demodulators. (F) Staff

143. Microfabrication Technology. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 40 and Physics 7B. Integrated circuit device fabrication and surface micromachining technology. Thermal oxidation, ion implantation, impurity diffusion, film deposition, etching, and passivation. Wafer bonding, contacts and interconnections, and process integration issues. Device design and mask layout, relation between physical structure and electrical/mechanical performance. Micromachining in micropatterning to radio receiver design. Power amplifier design with application to wireless radio transmitters. Radio-frequency mixers, oscillators, phase-locked loops, modulators, and demodulators. (F) Staff

144. Fundamental Algorithms for Systems Modeling, Analysis, and Optimization. (4) Four hours of lecture per week. Prerequisites: 20; Computer Science 61C. The modern systems and control approach to complex systems analysis using optimization and constraint satisfaction techniques. The course presents an overview of classical and modern techniques for constrained optimization problems. The course will cover classical and modern methods and provide students with the ability to model and solve optimization problems. Students will learn optimization techniques and how to apply them to real-world problems. (FSP) Staff

147. Introduction to Microelectromechanical Systems (MEMS). (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Physics 7B. This senior-level course will introduce undergraduate students to the rapidly expanding, multidisciplinary field of microelectromechanical systems (MEMS). It will provide an introduction to the fundamentals of micromachining and microfabrication techniques (including photolithography, thin film, and bulk etching and deposition and fixture design) and polymerics that will form the basis for developing microelectromechanical systems. (FSP) Staff

C213. Soft X-Rays and Extreme Ultraviolet Radiation. (3) Three hours of lecture per week. Prerequisites: Physics 110, 137, and Mathematics 53, 54 or equivalent. Formerly EI Engineering 290G. This course will explore the latest developments in the physics and applications of soft X-rays. It begins with a review of electromagnetic radiation at short wavelengths including dipole radiation, scattering and refractive index, using a simple scalar model. Subsequent discussions will include the generation of X-rays with laser tubes, synchrotron radiation, laser-plasma sources, X-ray lasers, and black body radiation. Concepts of spatial and temporal coherence, and interference phenomena will be discussed. Also listed as Applied Science and Technology C210. (F,SP) Staff

217. Microwave Circuits. (3) Three hours of lecture per week. Prerequisites: 117 and 140 or equivalent. Techniques of analog circuit technology in the high-frequency range are emphasized. Transmission lines, passive and distributed circuit elements; parameter design of high-frequency active circuits; computer-aided analysis and design. Emphasis on design of planar high-frequency amplifiers and oscillators using MMICs and silicon technology. Circuit building blocks for broadband wireless and wired communication will be emphasized including oscillators, low-noise amplifiers, and power amplifiers. Offered alternate years. (SP) Niknejad

219A. Numerical Simulation and Modeling. (4) Four hours of lecture per week. Prerequisites: Consent of instructor; a course in linear algebra and on circuits is very useful. Numerical simulation and modeling are enabling technologies that pervade science and engineering. This course provides a detailed introduction to the fundamental principles of these technologies and their translation to engineering practice. The course emphasizes hands-on programming in MATLAB and application to several domains, including circuits, nanotechnology, and biology. (F,SP) Roychowdhury

219B. Logic Synthesis and Modeling. (4) Four hours of lecture per week. Prerequisites: Consent of instructor; a course in linear algebra and on circuits is very useful. Numerical simulation and modeling are enabling technologies that pervade science and engineering. This course provides a detailed introduction to the fundamental principles of these technologies and their translation to engineering practice. The course emphasizes hands-on programming in MATLAB and application to several domains, including circuits, nanotechnology, and biology. (F,SP) Roychowdhury

219C. Computer-Aided Verification. (3) Three hours of lecture per week. Prerequisites: Consent of instructor; Computer Science 170 is recommended. Introduction to the theory and practice of formal methods for the design and analysis of systems, with a focus on automated algorithmic techniques. Course topics include computational logic and automata theory including formal models of reactive systems, temporal logic, model checking, and automated theorem provers. Applications in hardware and software verification, analysis of embedded, real-time, and hybrid systems, computer security, synthesis, planning, constraint solving, and other areas will be explored as time permits. Offered alternate years. (F,SP) Seshia

C219D. Concurrent Models of Computation. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Graduate standing and one of Concurrent models of computation (MoCs) with applications to software systems, embedded systems, and cyber-physical systems. Analysis for boundedness, deadlock, and determinism; formal semantics (fixed point semantics and metric-space models); composition; heterogeneity; and model-based design. MoCs covered may include process networks, threads, message passing, synchronous/reactive, dataflow, rendezvous, time-triggered, discrete events, and continuous time. Also listed as Computer Science C219D. (F,SP) Lee

221A. Linear System Theory. (4) Three hours of lecture and two hours of recitation per week. Prerequisites: 120; Mathematics 110 recommended. Basic system concepts; state-space and I/O representation. Properties of linear systems: observability, minimality, and state and output feedback. Stability. Observers. Characteristic polynomial. Nyquist test. (F,SP) Staff

222. Nonlinear Systems—Analysis, Stability, and Control. (3) Three hours of lecture per week. Prerequisites: 222A (may be taken concurrently). Basic graduate course in nonlinear systems. Second Order systems. Numerical solution methods, the describing function method, linearization. Stability—direct and indirect methods of Lyapunov. Applications to the Lure problem—Popov, circle criterion. Input-Output stability. Additional topics include bifurcations of dynamical systems, introduction to the “geometric” theory of control for nonlinear systems, passivity concepts, and dissipative dynamical systems. (SP) Staff


224A. Digital Communications. (4) Four hours of lecture and one hour of discussion per week. Prerequisites: 120 and 126, or equivalent. Formerly 224. Introduction to the basic principles and the design and analysis of modern digital communication systems. Topics include source coding; channel coding; baseband and passband modulation techniques; receiver design; channel coding; quantum limits; statistical techniques; block, convolutional, and trellis coding techniques; multiuser communications and spread spectrum; multi-carrier techniques and FDM; carrier and symbol synchronization. Applications to design of digital telephone modems, compact disks, and digital wireless communication systems are illustrated. The concepts are illustrated by a sequence of MATLAB exercises. (F,SP) Staff


225A. Digital Signal Processing. (3) Three hours of lecture per week. Prerequisites: 123 and 126 or solid background in stochastic processes. Advanced techniques in signal processing. Stochastic signal pro- cessing; spectral estimation; Kalman filters; adaptive filter- ing. Application to spectral estimation, speech and audio coding, adaptive equalization, noise cancellation, echo cancellation, and linear prediction. (F) Gasparr, Bahai

225B. Digital Image Processing. (3) Three hours of lecture per week. Prerequisites: 123. 2-D sequences and systems, separable systems, projection slice theorem, reconstruction from projections and partial Fourier information, 2D transforms, different equations, recur- sive and iterative filters, 2D DFT and FFT, 2D FIR filter design; human eye, perception, psychophysical vision properties, photometry and colorimetry, optics and image systems, image enhancement, image restora- tion, image compression, digital optical signal processing, image processing, halftoning, edge detection, image compression; scalar quantization, lossless coding, huffman coding, arithmetic coding; dictionary tech- niques, wavelet and transform coding DCT, KLT, and wavelet packet; multiresolution coding, image coding, fractal coding, vector quantization, motion estimation and compensation, standards; JPEG, MPEG, H.263, pre- and post-processing, scalable and video coding, multimedia communica- tion over noisy channels. (F,SP) Zakhor

225D. Audio Signal Processing in Humans and Machines. (3) Three hours of lecture per week. Prerequisites: 123 or equivalent; Statistics 200A or equivalent; or graduate standing and consent of instructor. Introduction to the signal processing and analysis of pattern recognition. Introduction to coding, synthesis, and recognition. Models of speech and music pro- duction and perception. Signal processing for speech production and perception. Also listed as Bio- informatics and Computer Science 225D. (F,SP) Staff

225E. Principles of Magnetic Resonance Imaging. (3) Student will receive no credit for Electrical Engineering C225E after taking Bioengineering 265. Three hours of lecture per week. Fundamentals of MRI including signal-to-noise ratio, resolution, and contrast. Advanced techniques in MRI including image reconstruction and instrumentation. Image reconstruction via 2D FFT methods. Fast imaging reconstruction via convolution- back projection and gridding methods and FFTs. Fundamentals of modern MRI including slice selection, field, gradient fields, RF coils, and shim supplies. Soft- ware for MRI including imaging methods such as 2D FT, RARE, SSSF, spiral and echo planar imaging methods. Fundamental tradeoffs of tailoring hardware and pulse sequences to specific applications. The modern MRI “toolbox” will be introduced, including selecting a slice or volume, fast imaging methods to avoid artifacts due to motion, and the algorithms and methods for functional imaging. Also listed as Bio- engineering C265. (F,SP) Conolly, Lustig

226A. Random Processes in Systems. (3) Four hours of lecture and one hour of discussion per week. Prerequisites: 120 and Statistics 200A or equivalent. Basic theory and examples of random processes as they apply to the design and analysis of systems, with emphasis on random signals. Introduction to the basic principles and the design and analysis of random digital communication systems. Techniques of random signal processing and analysis. Frequency re-use, sectorization. Multiple access and interference management in wireless networks. Spread spectrum communication. Multiple access and symbol synchronization. Applications to design of digital telephone modems, compact disks, and digital wireless communication systems are illustrated. The concepts are illustrated by a sequence of MATLAB exercises. (F,SP) Staff

226B. Random Processes in Systems. (3) Four hours of lecture and one hour of discussion per week. Prerequisites: 120 and Statistics 200A or equivalent. Basic theory and examples of random processes as they apply to the design and analysis of systems, with emphasis on random signals. Introduction to the basic principles and the design and analysis of random digital communication systems. Techniques of random signal processing and analysis. Frequency re-use, sectorization. Multiple access and interference management in wireless networks. Spread spectrum communication. Multiple access and symbol synchronization. Applications to design of digital telephone modems, compact disks, and digital wireless communication systems are illustrated. The concepts are illustrated by a sequence of MATLAB exercises. (F,SP) Staff

227A. Introduction to Convex Optimization. (4) Four hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: Mathematics 54 and Statistics 2 or equivalents. Convex optimization is a class of nonlinear optimization problems where the objective to be minimized, and the constraints, are both convex. Contrary to the more classical linear programming framework, convex pro- grams often go unrecognized, and this is a pity since a large class of convex optimization problems can now be efficiently solved. In addition, it is possible to address hard, non-convex problems (such as “combinatorial optimization” problems) using convex approximations that are more efficient than classical linear ones. This course covers some convex optimization theory and algorithms, and describes various applications arising in engineering design, machine learning and statistics, finance, and operations research. The course includes laboratory assignments, which consist of hands-on experiments with the optimization software CVX, and a discussion section. (F,SP) El Ghaoui, Wainwright

C227A. Introduction to Convex Optimization. (4) Three hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: Mathematics 54 and Statistics 2 or equivalents. Convex optimization is a class of nonlinear optimization problems where the objective to be minimized, and the constraints, are both convex. Contrary to the more classical linear programming framework, convex pro-
grants often go unrecognized, and this is a pity since a large class of convex optimization problems can now be efficiently solved. In addition, it is possible to address certain combinatorial optimization problems (such as ‘combinatorial optimization’ problems) using convex approximations that are more efficient than classical linear ones. The course covers some convex optimization theory, applications and describes various applications arising in engineering design, machine learning and statistics, finance, and operations research. The course includes laboratory assignments, which constitute an important part of the student’s experience. Also listed as Industrial Engineering C227A, (F,SP) El Ghaoui, Wainwright

227B. Convex Optimization and Approximation. (3) Three hours of lecture per week. Prerequisites: 227A or consent of instructor. Convex optimization as a systematic approximation tool for hard decision problems. Approximations of combinatorial optimization problems, of stochastic programming problems, of robust optimization problems (i.e., with optimization problems with unknown but bounded data), of control optimization problems. Quality estimates of the resulting approximation. Applications in robust engineering design, statistics, control, finance, data mining, operations research. (F,SP) El Ghaoui, Wainwright

C227B. Convex Optimization and Approximation. (3) Three hours of lecture per week. Prerequisites: 227A or C227A or Industrial Engineering and Operations Research C227A or consent of instructor. Convex optimization as a systematic approximation tool for hard decision problems. Approximations of combinatorial optimization problems, of stochastic programming problems, of robust optimization problems (i.e., with optimization problems with unknown but bounded data), of control optimization problems. Quality estimates of the resulting approximation. Applications in robust engineering design, statistics, control, finance, data mining, operations research. (F,SP) El Ghaoui, Wainwright

228A. High-Speed Communications Networks. (3) Three hours of lecture per week. Prerequisites: 122 or 226A (may be taken concurrently). Descriptions, models, and approaches to the design and management of networks. Optical transmission and switching; plane wave models; described and analyzed using deterministic, stochastically, and simulation models. FDDI, QDB, SMDS, Frame Relay, ATM, networks, and SONET. Applications demanding high-speed communication. (F) Staff

229A. Information Theory and Coding. (3) Three hours of lecture per week. Prerequisites: 226 recommended, Statistics 200A or equivalent. Formerly 229. Fundamental bounds of Shannon theory and their application. Source and channel coding, channel capacity problems. (F,SP) Zoltowski, Anantharam, Tae

229B. Error Control Coding. (3) Three hours of lecture per week. Prerequisites: 126 or equivalent (some familiarity with basic probability and prior exposure to information theory not necessary. Error control codes are an integral part of most communication and recording systems where they are primarily used to provide reliable transmission. In this course, we will cover the basics of error control coding for reliable digital transmission and storage. We will discuss the major classes of codes that are important in practice, including Reed Muller codes, cyclic codes, Reed Solomon codes, convolutional codes, concatenated codes, turbo codes, and low density parity check codes. The relevant background material from finite field and polynomial algebra will be developed in the course. Overview of topics: binary linear block codes; Reed Muller codes; Galois fields; linear block codes over a finite field; cyclic codes; BCH and Reed Solomon codes; convolutional codes and trellis based decoding, message passing decoding, turbo codes; trellis based soft-decision decoding of block codes; turbo codes; low density parity check codes. (SP) Anantharam


231. Solid State Devices. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 130 or equivalent. Physical principles and operational characteristics of semiconductor devices. Emphasis is on MOS field-effect devices and the behavior that is dictated by present and probable future technologies. Metal-oxide-semiconductor systems, short-channel and high field effects, device modeling, design and impact on analog, digital circuits. (SP) Subramanian, King Liu, Salahuddin


233. Lightwave Systems. (3) Three hours of lecture per week. Prerequisites: 120 and 121 or equivalent; 136 recommended. The properties of optical fibers: dispersion, attenuation, nonlinear effects (solitons). Direct-detection systems: analog and digital modulation, transmitter design, receiver design, noise properties, optical and electrical fiber loss, dependence on source coherence, subcarrier and multichannel CATV analog transmission issues of the role of optical fiber amplifiers. Common coherence: FM noise and modulation properties of laser diodes, quantum limit detection, homodyne and heterodyne detection of various formats, laser linewidth requirements, diversity issues. Lightwave networks: WDMA, FDMA, subcarrier, TDMA, and CDMA, relative merits. Topological aspects of analog and digital fiber link networks, hot-potato routing, the role of optical switching. Optical network access protocols. Optical interconnection in high-speed circuit modules and computers. (SP) Staff

C235. Nanoscale Fabrication. (3) Four hours of lecture and one hour of discussion per week. Prerequisites: 136. The course covers some convex optimization application. Source and channel coding theorems. (F) Staff

236A. Quantum and Optical Electronics. (3) Three hours of lecture per week. Prerequisites: 117A, Physics 137A or equivalent. Interactions of radiation with atomic and semiconductors systems, density matrix treatment, semiclassical laser theory (Lamb’s), laser resonators, specific laser systems, laser dynamics, Q-switching and mode-locking, noise in lasers and amplifiers, optical feedback and chaos, non-linear optics, pulsation, electrooptics, acoustooptics and magnetooptics, coherent optics, stimulated Raman and Brillouin scattering. Offered alternate years. (F,SP) Staff

C237. Partially Ionized Plasmas. (3) Three hours of lecture per week. Prerequisites: Upper division course in plasma physics or equivalent 239. Introduction to partially ionized, chemically reactive plasmas, including collisional processes, diffusion, sources, sheaths, boundaries, and diagnostics. DC, RF, and microwave discharges; gas discharges in micro- and nano-plasma-assisted materials processing and to plasma wall interactions. Also listed as Applied Science and Technology C237. Offered alternate years. (SP) Staff


241. Advanced Digital Integrated Circuits. (3) Three hours of lecture per week. Prerequisites: 142, 240. Analysis, evaluation and design of present-day integrated circuits for communication applications, particularly those for which nonlinear effects must be included. Design, analysis and simulation of BICMOS circuits, audio and video power amplifiers, optimum performance of near-sinusoidal oscillators and frequency-translation circuits. Phase-locked loops, spread-spectrum circuits. Application, synthesis, and implementation of analog, digital and mixed circuit design. Design and implementation of analog digital converters; advanced components for telecommunication circuits. Use of new CAD tools and systems. (F,SP) Niknejad

243. Advanced IC Processing and Layout. (3) Three hours of lecture per week. Prerequisites: 143 and Physics 140 or 141. The course covers some convex optimization extraction of integrated circuits. Optical, X-ray, and e-beam lithography, ion implantation, oxidation and diffusion. Thin film deposition. Wet and dry etching and ion placement and defect and fault detection. (F,SP) Staff

244. Fundamental Algorithms for Systems Modeling, Analysis, and Optimization. (4) Four hours of lecture per week. Prerequisites: Graduate standing. The course covers some convex optimization circuits and to digital circuits. (SP) Keutzer, Lee, Roychowdhury, Seshia

C245. Introduction to MEMS Design. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing in engineering or physics, undergraduate with consent of instructor. CAD for MEMS. Design and fabrication of complex systems requires a range of algorithms and design software. This course reviews the fundamental techniques governing the design methodology for complex systems, using integrated circuit design as a primary example. Topics include computer-aided and continuous models and algorithms, and strategies for implementing algorithms efficiently and correctly in software. Laboratory assignments and a class project are required. (SP) Staff

246. Parametric and Optimal Design of MEMS. (3) Three hours of lecture per week. Prerequisites: Mechanical Engineering C218/Electrical Engineering C245 are highly recommended but not mandatory. Parametric design and optimal design of MEMS. Emphasis on design, analysis, and optimization of MEMS structures. Hands-on design problems to determine the dimensions of MEMS structures for specified function. Trade-off of various performance requirements despite conflicting design
requirements. Structures include flexure systems, accelerometers, and rate sensors. Also listed as Mechanical Engineering C219. (SP) Lin, Pisano


248. Embedded System Design: Models, Validation, and Synthesis. (4) Four hours of lecture and two hours of laboratory/discussion per week. Prerequisites: Background in SoC design, operating systems and compilers, or consent of instructor. Principles of embedded system design. Focus on design methodologies and foundations. Platform-based design and communication-based design and their relationship with design time, re-use, and performance. Models of computation and their use in design capture, manipulation, verification, and synthesis. Mapping into architectures and tools. Performance estimation, scheduling and real-time requirements. Synchronous languages and time-triggered protocols to simplify the design process. Simulation techniques for highly complex computer systems. Synthesis and successive refinement: meta-model of computation. Use of design tools and analysis of their capabilities and limitations: Ptolemy, POLIS, Metropolis, VCC, CoWare. (F,SP) Boser

290. Advanced Topics in Electrical Engineering. Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: Consent of instructor. The 290 courses cover current topics of research interest in electrical engineering. The course content may vary from semester to semester.

290A. Advanced Topics in Computer-Aided Design. (1-3)

290B. Advanced Topics in Solid State Devices. (1-3)

290C. Advanced Topics in Circuit Design. (1-3)

290E. Advanced Topics in Electromagnetics and Plasmas. (1-3)

290F. Advanced Topics in Photonics. (1-3)

290H. Advanced Topics in Semiconductor Manufacturing. (1-3)

290N. Advanced Topics in System Theory. (1-3)

290O. Advanced Topics in Control. (1-3)

290P. Advanced Topics in Bioelectronics. (1-3)

290Q. Advanced Topics in Communication Networks. (1-3)

290S. Advanced Topics in Communications and Information Theory. (1-3)

290T. Advanced Topics in Signal Processing. (1-3)

290Y. Organic Materials in Electronics. (3) Prerequisites: 130; undergraduate general chemistry. Organic materials and molecules of interest in applications to electronics and optoelectronics. This course will provide an overview of the properties of the major classes of organic materials with relevance to electronics. Students will study the technology, physics, and chemistry of their use in the three most rapidly growing major applications—energy conversion/generation devices (fuel cells and photovoltaics), organic light-emitting diodes, and organic transistors. (F,SP) Subrahmanyan

C291. Control and Optimization of Distributed Parameter Systems. (3) Three hours of lecture per week. Distributed systems and PDE models of physical phenomena (propagation of waves, network traffic, water distribution, fluid mechanics, electromagnetics, blood vessels, beams, road pavements, structures, etc.). Fundamental solution methods for


C291E. Hybrid Systems and Intelligent Control. (3) Three hours of lecture per week. Formerly 291E. Prerequisites: 145. Control and design of hybrid systems. Analysis and control of hybrid systems. The Signal-to-symbol conversion and logic controllers. Discrete-event systems models and language descriptions. Finite-state machines and automata. Modelling and control of hybrid systems. (SP) Garcia

297. Field Studies in Electrical Engineering. (1-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Supervised experience in off-campus companies relevant to specific aspects and applications of electrical engineering. Written report required at the end of the semester. (F,SP) Staff

298. Group Studies, Seminars, or Group Research. (1-4) Course may be repeated for credit. One to four hours of lecture per section. Section 1-4 to be graded on a satisfactory/unsatisfactory basis. Sections 41-49 to be graded on a letter-grade basis. Advanced study in various subjects through special seminars on topics to be selected each year, informal group study of specialized topics, group participation in comprehensive design problems, or group research on complete problems for analysis and experimentation. (F,SP) Staff

299. Individual Research. (1-12) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Independent study, in consultation with faculty member. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Independent study in consultation with faculty member. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

Professional Courses

301. Teaching Techniques for Electrical Engineering. (1) One and one-half hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Weekly seminars and discussions of effective teaching techniques. Use of educational objectives, alternative forms of instruction, and special techniques for teaching key concepts and techniques in electrical engineering. Student and self-evaluation. Course is intended to orient new graduate student instructors to teaching in the Electrical Engineering Department at Berkeley. (F,SP) Staff

Computer Science

Except for CS 2, 95, and 99, the lower-division Computer Science courses are subject to the “computing service” course restriction. See Computing Service Courses on page 238.

Lower Division Courses

3L. Introduction to Symbolic Programming. (4) Three lecture hours and one hour of laboratory per week. One hour of lecture and six hours of laboratory per week and approximately five hours of self-scheduled programming laboratory. Prerequisites: High school algebra. Introduction to computer programming, emphasizing symbolic computation and functional programming style. Students will write a project of at least 200 lines of code in Scheme (a dialect of the LISP programming language). (F,SP) Clancy

3S. Introduction to Symbolic Programming (Self-Paced). (1-4) Refer to computer science service course restrictions. Course may be repeated for 1-4 units. One to four hours of discussion and three to nine hours of laboratory per week. Prerequisites: High school algebra. The same material as 3 but in a self-paced format. Introduction to computer programming, emphasizing symbolic computation and functional programming style, using the Scheme programming language. Units assigned depend on amount of work completed. The first two units must be taken together. (F,SP) Garcia

9A. MATLAB for Programmers. (1) Refer to computer science service course restrictions. Self-paced. Must be taken on a passed/not passed basis. Prerequisites: Programming experience equivalent to that gained in 3; familiarity with applications of matrix processing. Introduction to the constructs in the MATLAB programming language, aimed at students who already know how to program. Array and matrix operations, functions and function handles, control flow, plotting and image manipulation, cell arrays and structures, and the Symbolic Mathematics toolbox. (F,SP) Garcia

9B. Pascal for Programmers. (1) Refer to computer science service course restrictions. Self-paced. Must be taken on a passed/not passed basis. Prerequisites: Programming experience similar to that gained in 3 or Engineering 7 or 77. Self-paced Pascal course for students who already know how to program. This course provides the practice with the use of pointers and linked data structures that is assumed as prerequisite for 9C and 9F. (F,SP) Garcia

9C. C for Programmers. (1) Refer to computer science service course restrictions. Must be taken on a passed/not passed basis. Prerequisites: Programming experience equivalent to that gained in 3 or Engineering 7 or 77. Self-paced course in the C programming language for students who already know how to program. Computation, input and output, flow of control, functions, arrays, and pointers, linked structures, use of dynamic storage, and implementation of abstract data types. (F,SP) Garcia

9D. Scheme and Functional Programming for Programmers. (1) Refer to computer science service course restrictions. Must be taken on a passed/not passed basis. Prerequisites: Programming experience equivalent to that gained in 3 or Engineering 7 or 77. Self-paced course in functional programming, using the Scheme programming language, for students who already know how to program. Recursion; higher-order functions; functional language (or assembly language) and linked data structures equivalent to that gained in 9B, 61A, or Engineering 7 or 77. Self-paced course in the C programming language for students who already know how to program. (F,SP) Garcia

9E. Productive Use of the UNIX Environment. (1) Refer to computer science service course restrictions. Self-paced. Must be taken on a passed/not passed basis. Prerequisites: Programming experience similar to that gained in 61A or Engineering 7 or 77. DOS or UNIX experience. Use of UNIX utilities and scripting facilities for customizing the programming environment, organizing files (possibly in more than one computer account), implementing a personal database, reformating text, and searching for online resources. (F,SP) Garcia

9F. C++ for Programmers. (1) Refer to computer science service course restrictions in this catalog. Must be taken on a passed/not passed basis. Prerequisites: Programming experience equivalent to that gained in 9B, 61A, or Engineering 7 or 77. Self-paced introduction to the constructs provided in the C++ programming language for procedural and object-oriented programming, aimed at students who already know how to program. (F,SP) Garcia

9G. JAVA for Programmers. (1) One hour of self-paced per week. Must be taken on a passed/not passed basis. Prerequisites: 9C or 9F or 61A plus experience with object-oriented programming or C-
based language. Self-paced course in Java for students who already know how to program. Applets; variables and computation; events and flow of control; classes and objects; inheritance; GUI elements; applications; arrays, strings, files, and linked structures; exceptions; threads. (F,SP) Garcia

9H. Python for Programmers. (1) Refer to computer science service course restrictions. Self-paced. Must be taken on a passed/not passed basis. Prerequisites: Programming experience obtained in 3. Introduction to the constructs provided in the Python programming language, aimed at students who already know how to program. Flow of control, data structures, lists, and dictionaries; CGI programming; file input and output; object-oriented programming; GUI elements. (F,SP) Garcia

10. The Beauty and Joy of Computing. (4) Two hours of lecture, four hours of laboratory, and one hour of discussion per week per unit. An introduction to the beauty and joy of computing. The history, social implications, great principles, and future of computing. Beautiful applications that have changed the world. Relevance of computing to the student and society will be emphasized. Students will learn the joy of programming a computer using a friendly, graphical language, and will complete a substantial project. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limited by the faculty, but the suggested limit is 25. (F,SP)

47A. Completion of Work in Computer Science 61A. (1) Students will receive no credit for 47A after taking 61A. Self-paced. Prerequisites: 61B or equivalent, consent of instructor. Implementation of generic operations. Streams and iterators, implementation techniques for supporting functional, object-oriented, and constraint-based programming in the Scheme programming language. Together with 9D, 47A constitutes an abbreviated, self-paced version of 61A for students who have already taken a course equivalent to 61B. (F,SP) Garcia

47B. Completion of Work in Computer Science 61B. (1) Students will receive no credit for 47B after taking 61B. Self-paced. Prerequisites: 61B or equivalent, consent of instructor. Iterators, Hashing, applied to strings and multi-dimensional structures. Heaps. Storage management. Design and implementation of a program containing hundreds of lines of code. Students with sufficient partial credit in 61B may, with consent of instructor, complete the credit in this self-paced course. (F,SP) Garcia

47C. Completion of Work in Computer Science 61C. (1) Students will receive no credit for 47C after taking 61C. Self-paced. Prerequisites: Experience with assembly language including writing an interrupt handler, 9C or equivalent, and consent of instructor. Memory management. The assembly language and linking process. Caches and virtual memory. Pipelined computer organization. Students with sufficient partial credit in 61C may, with consent of instructor, complete the credit in this self-paced course. (F,SP) Garcia

61A. Structure and Interpretation of Computer Programs. (4) Students will receive no credit for 61A after taking 47A. Three hours of lecture, one and one-half hours of discussion, and one and one-half hours of laboratory and two and one-half hours of unscheduled outside work required. Prerequisites: Mathematics 1A (may be taken concurrently); programming experience equivalent to that gained in 3 or the Advanced Placement Computer Science A course. Introduction to programming and computer science. Students will vary from confidence and abstraction at several levels: (1) within a programming language, using higher-order functions, manifest types, data-directed programming, and message-passing; (2) between languages, using functional and rule-based languages as examples. It also relates these techniques to the practical problems of implementation of algorithms and languages on a von Neumann machine. There are several significant programming projects, programmed in a dialect of the LISP language. (F,SP) Garcia, Harvey, Hillinger

61B. Data Structures. (4) Students will receive no credit for 61B after taking 47B or 61BL. Deficiency in 61BL may be removed by taking 61B. Three hours of lecture, one and one-half hours of laboratory per week. Prerequisites: 61A or Engineering 7. The same material as in 61B but in a laboratory-based format. (F,SP) Hillinger, Schewchuk

61C. Machine Structures. (4) Students will receive no credit for 61C after taking 47C or 61CL. Deficiency in 61CL may be removed by taking 61CLC. Three hours of lecture, two hours of laboratory, and one hour of discussion per week. Prerequisites: 61A along with either 61B or 61BL or programming experience equivalent to that gained in 9C, 9F, or 9G. The internal organization and operation of digital computers. Integer and floating-point representations, high-level languages (logic, arithmetic, instruction sequencing) and operating systems (I/O, interrupts, memory management, process switching). Elements of computer logic design. Tradeoffs in the design of fundamental architectural design decisions. (F,SP) Staff

61CL. Machine Structures (Lab-Centric). (4) Students will receive no credit for 61CL after taking 47CL or 61CLC. Deficiency in 61CLC may be removed by taking 61CLC. Two hours and one-half hours of laboratory per week. Prerequisites: 61A, along with either 61B or 61BL or programming experience equivalent to that gained in 9C, 9F, or 9G. The same material as in 61CL in a lab-centric format. (F,SP) Garcia, Thomas

70. Discrete Mathematics and Probability Theory. (4) Students will receive no credit for 70 after taking Mathematics 55. Three hours of lecture per week, and three hours of lecture and two hours of discussion per week for upper-division students in good standing who wish to under- take a program of individual inquiry initiated jointly by the student and a professor. There are no formal prerequisites, but the supervising professor must be convinced that the student is able to profit by the program. (F,SP) Staff

Upper Division Courses

C149. Introduction to Embedded Systems. (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: 61A or Electrical Engineering 20. Formerly Electrical Engineering 124. This course introduces students to the basics of models, analysis tools, and control for embedded systems operating in real-time. Students learn how to combine physical processes with computation. Topics include models of computation, control, analysis and verification, interfacing with the physical world, mapping control systems, and development of embedded systems. The course has a strong laboratory component, with emphasis on a semester-long sequence of projects. Also listed as Electrical Engineering C149. (F,SP) Staff

150. Components and Design Techniques for Digital Systems. (5) Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: 61C. Electrical Engineering 40 or 42. Basic building blocks and design methods to construct synchronous digital systems. Alternative representations for digital systems. Bipolar TTL vs. MOS implementation technologies. Standard logic (SSI, MSI) vs. programmable logic (PLD, FPGA). Finite state machine design. Digital computer architecture blocks as case studies. Introduction to computer-aided design software. Formal hardware laboratories and substantial design project. Informal software laboratory periodically throughout the semester. (F,SP) Staff

152. Computer Architecture and Engineering. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 61C. Instruction set design, Register Transfer. Computer design project requiring about 100 hours. Data-path design, Controller design. Memory system, Addressing, Microprogramming. Computer arithmetic. Survey of real computers and microprocessors. (F,SP) Culie, Kubiatowicz, Wawrzynek

160. User Interface Design and Development. (4) Three hours of lecture, three hours of laboratory, and four hours of self-scheduled programming laboratory per week. Prerequisites: 61B. The design, implementation, and evaluation of human/computer interfaces. Interaction techniques (keyboard, pointing, display, audio, etc.), metaphors (desktop, notecards, rooms, ledger sheets, tables, etc.), interaction styles and dialog models, design examples, and user-centered design and task analysis. Interface-development methodology, representation tools, testing, and quality assessment. Students will develop a direct-manipulation interface. Agrawala, Canny, Hartmann

161. Computer Security. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61C. Formerly Computer Science 165. (Discrete Mathematics) or Mathematics 55. Introduction to computer security. Cryptography, including encryption, authentication, hash functions, cryptographic protocols, and applications. Operating system security, the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The required courses for the 22-credit requirement vary from semester to semester. Enrollment limited to 15 sophomores. (F,SP)
access control. Network security, firewalls, viruses, and worms. Software security, defensive programming, and language-based security. Case studies from real-world systems. (F,SP) Staff


164. Programming Languages and Compilers. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61B and 61C. Survey of program-ming languages. The design of modern pro- gramming languages. Principles and techniques of scanning, parsing, semantic analysis, and code genera- tion. Implementation of compilers, interpreters, and assemblers. Overview of run-time organization and error handling. (F,SP) Bodik, Hillinger, Nuclea

169. Software Engineering. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61B and 61C. Survey of pro- gramming languages. The design of modern pro- gramming languages. Principles and techniques of scanning, parsing, semantic analysis, and code genera- tion. Implementation of compilers, interpreters, and assemblers. Overview of run-time organization and error handling. (F,SP) Bodik, Hillinger, Nuclea

170. Efficient Algorithms and Intractable Problems. (4) Three hours of lecture and one hour of dis- cussion per week. Prerequisites: 61B, 61C, Math 55 or 113. Ideas and techniques for designing efficient algorithms for the solution of problems on computer systems. Function-oriented and object-oriented modular design techniques, designing for re-use and maintainability. Specification and documentation. Veri- fication and analysis of time and space complexity estimates. Project team organization and management. Students will work in teams on a substantial project. (F,SP) Brewer, Fox, Nuclea, Sen

177. Computability and Complexity. (4) Three hours of lecture and one hour of discussion per week. Prerequi- sites: 170. Finite automata, Turing machines and RAMs. Undecidable, exponential, and polynomial-time problems. Models of computation. Basic concepts and techniques in the design and analysis of algorithms; models of computation; lower bounds; algorithms for optimum search trees, balanced trees and UNION-FIND algorithms; numerical and algebraic algorithms; combinational algorithms. Turing machines, how to count steps, deterministic and nondeterministic Turing machines, NP-completeness. Unsolvable and intractable problems. (F,SP) Staff

178. Theory of Computation. (4) Three hours of lecture and one hour of discussion per week. Prerequi- sites: 170. Finite automata, Turing machines and RAMs. Undecidable, exponential, and polynomial-time problems. Models of computation. Basic concepts and techniques in the design and analysis of algorithms; models of computation; lower bounds; algorithms for optimum search trees, balanced trees and UNION-FIND algorithms; numerical and algebraic algorithms; combinational algorithms. Turing machines, how to count steps, deterministic and nondeterministic Turing machines, NP-completeness. Unsolvable and intractable problems. (F,SP) Staff

182. Introduction to Artificial Intelligence. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 61B and 61C and consent of instructor; 70 or Mathematics 55. Basic ideas and techniques under- lying the design of intelligent computer systems. Topics include heuristic search, problem solving, game play, knowledge representation, logical inference, plan- ning, reasoning under uncertainty, expert systems, learning, perception, language understanding. (F,SP) Klein, Malik

C191. Quantum Information Science and Techno- logy. (5) Three hours of lecture and discussion per week. Prerequisites: Mathematics 54, Physics 7A-7B, and either Physics 7C, Mathematics 55, or Computer Science 170. This multidisciplinary course provides an introduction to the fundamental concepts of quantum mechanics from a computational and infor- mational theoretic perspective, as well as physical implementations and technological applications of quantum information science. Basic sections of quan- tum algorithm complexity, and cryptography, will be touched upon, as well as pertinent physical realiza- tions from nanoscale science and engineering. Also listed as Physics C191 and Chemistry C191. (F,SP) Crompton, Vandersypen, Millen

184. Special Topics. (1-4) Course may be repeated for credit as topic varies. One to four hours of lect- ure/discussion per week. Prerequisites: Consent of instructor. Topics will vary semester to semester. See the Computer Science Division Announcements. (F,SP) Staff

185. Social Implications of Computer Technology. (1) Students will receive no credit for 195 after taking C195/Interdisciplinary Field Study C155 or H195. One and one-half hours of lecture per week. Must be taken on a pass/no pass basis. This course will examine the use of elec- tronic communication; the changing nature of work; tech- nological risks; the information economy; intellectual property; privacy, artificial intelligence and the sense of self; and model-based design. Students will lead discussions on additional topics. (F,SP) Staff

H195. Honors Social Implications of Computer Technology. (3) Students will receive no credit for H195 after taking C195/Interdisciplinary Field Study C155 or H195. One and one-half hours of lecture per week. Must be taken on a pass/no pass basis. This course will examine the use of elec- tronic communication; the changing nature of work; technological risks; the information economy; intellectual property; privacy, artificial intelligence and the sense of self; and model-based design. Students will lead discussions on additional topics. (F,SP) Harvey

H196A-H196B. Senior Honors Thesis Research. (1-4) Individual research. Prerequisites: Open only to students in the Computer Science Honors Program. Thesis work under the supervision of a faculty mem- ber. To obtain credit the student must, at the end of two semesters, submit a satisfactory thesis to the Electrical Engineering and Computer Science depart- ment archive. A total of 4 units must be taken. The units may be distributed between one or two semes- ters in any way. H196A-H196B count as graded tech- nical credit units, but may not be used to satisfy the requirement for 27 upper division technical units in

the College of Letters and Science with a major in computer science. (F,SP)

198. Directed Group Studies for Advanced Under- graduates. (1-4) Course may be repeated for credit. Course format varies with section. Must be taken on a pass/no passed basis. Prerequisites: 2.0 GPA or better; 60 units completed. Group study of selected topics in computer sciences, usually relating to new developments.

199. Supervised Independent Study. (1-4) Enroll- ment is restricted; see the Introduction to Courses and Curricula section of this catalog. Individual con- ferences. Must be taken on a pass/not passed basis. Prerequisites: Consent of instructor and major advisor. Supervised independent study. Enrollment restrictions apply. (F,SP) Staff

Graduate Courses

C219D. Concurrent Models of Computation. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequi- sites: Graduate standing. Theory and practice of concurrent models of computation (MoCs) with appli- cations to software systems, embedded systems, and cyber-physical systems. Analysis for boundedness, deadlock, and determinacy; formal semantics (fixed point semantics and metric-space models); composi- tion; Kronecker and; monomiality; and locality. MoCs covered may include process networks, threads, mes- sage passing, synchronous/reactive, dataflow, rendez- vous, time-triggered, discrete events, and continuous time. Also listed as Electrical Engineering C219D. (F,SP) Lee

250. VLSI Systems Design. (4) Three hours of lecture and four hours design laboratory per week. Prerequi- sites: 150. Unified top-down and bottom-up design of integrated circuits and systems concentrating on archi- tectural and topological issues. VLSI architectures, systolic arrays, self-timed systems. Trends in VLSI development. Physical limits. Tradeoffs in custom- design, standard cells, gate arrays. VLSI design tools. (F,SP) Fuehrer

252. Graduate Computer Architecture. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 152. Graduate survey of contemporary computer organizations covering: early systems, CPU design, instruction sets, control, processors, busses, ALU, memory, I/O interfaces, connection networks, virtual memory, pipelined computers, multiprocessors, and case studies. Term paper or project is required. (F,SP) Culler, Kubiatowicz, Patterson

258. Parallel Processors. (3) Three hours of lecture per week. Prerequisites: 162 and 164. Study of computer architecture for multiprocessor systems. Study of software and hardware architectures for parallelism and scalability of modern par- allel architectures. Design, engineering, and evaluation of modern parallel computer systems. Fundamental design: naming, synchroniza- tion, latency, and bandwidth. Architectural evolu- tion and technological driving forces. Parallel programming models, communication primitives, pro- gramming and compilation techniques, multipro- gramming workloads and methodology for quantitative evaluation. Latency avoidance through replication in small- and large-scale shared memory designs; cache- coherency, protocols, directories, and memory con- sistency models. Message passing; protocols, storage management, and deadlock. Efficient network inter- face, protection, events, active messages, and co- processors in large-scale designs. Latency tolerance through prefetching, multithreading, dynamic instruc- tion scheduling, and software techniques. Network design: topology, packaging, k-ary n-cubes, perfor- mance under contention. Synchronization: global opera- tions, mutual exclusion, and events. Alternative architectures: dataflow, SIMD, systolic arrays. Culler

260. User-Interfaces to Computer Systems. (3) Three hours of lecture per week. Prerequisites: 162 and 164 recommended, or consent of instructor. Formerly CS 287. Design and implementation of user-inter- faces to computer systems. Software and hardware architectures for personal computer and worksta- tion-oriented programming systems. Form-based user-inter- faces. Window and display management abstractions. Case studies of naive- and expert-user interfaces. Students will complete a substantial project. Canny
261. Security in Computer Systems. (3) Three hours of lecture per week. Prerequisites: 162. Graduate survey of modern topics in computer security, including authentication, access control, distributed and mobile systems, security protocol design, denial of service, firewalls, secure coding practices, safe languages, mobile code, and case studies from real-world systems. May also cover cryptographic protocols, privacy, and anonymity, and other topics as time permits. (SP) D. Song, Wagner

261N. Internet and Network Security. (3) Three hours of lecture per week. Prerequisite: 164. Introduction to the problems of internet security and key security objects for those interested in conducting research in the area or those more broadly interested in security or networking. Potential topics include denial-of-service; capabilities; network address translation; firewalls; security protocols; scanning; traffic analysis; legal issues; web attacks; anonymity; wireless and networked devices; honeypots; botnets; scams; underground economy; attack detection; and engineering of large software systems. Homework assignments, exam, and term paper or project required. (F,SP) Brewer, Hellerstein

262A. Advanced Topics in Computer Systems. (4) Three hours of lecture per week. Prerequisites: 162. Advanced course in computer systems emphasizing design and research techniques. A broad range of topics is included each year. Recent topics include computer architectures, operating systems, and software engineering. Laboratory assignments. (P) Ptolemy, C. Jay Hansen

262B. Advanced Topics in Computer Systems. (3) Three hours of lecture per week. Prerequisites: 262A. Continuing study emphasizing design and research techniques for constructing large-scale systems. More emphasis is placed on techniques for managing and structuring information. Topics include basic performance measurement; extensibility, with attention to protection, security, and management of abstract data types and index structures; high-level design and concurrency control; system support for networking, including remote procedure calls, transactional RPC, TCP, and active messages; security infrastructure; extending existing systems; performance analysis and engineering of large software systems. Homework assignments, exam, and term paper or project required. (F,SP) Staff

263. Design of Programming Languages. (3) Three hours of lecture per week. Prerequisites: 164. Selected topics from analysis, comparison, and design of programming languages, formal description of syntax and semantics, advanced programming techniques, structured programming, debugging, verification of programs and compilers, and proofs of correctness. Necula

264. Implementation of Programming Languages. (4) Three hours of lecture, one hour of discussion, and six hours of programming laboratory per week. Prerequisites: 164 or permission of instructor. Formerly 292K. Fundamental techniques for implementing high-level languages. Emphasis on the design and implementation of interpreters and compilers. Analysis of the efficiency of modern optimization algorithms and techniques. The use of object oriented design and implementation. Students should already be familiar with basic concepts such as transducers, abstract data types, and functional programming. RA

265. Compiler Optimization and Code Generation. (3) Three hours of lecture per week. Prerequisites: 162 and 269. The design and implementation of compiler systems. This course provides a graduate-level introduction to advanced computer graphics algorithms and techniques. Students should already be familiar with advanced computer graphics algorithms and techniques. RA

266. Introduction to System Performance Analysis. (3) Three hours of lecture per week. Prerequisites: 162 and Statistics 5. Formerly 267 and 268. Performance analysis and design of computer systems. Techniques used will include queuing theory, simulation, algorithm design, network analysis, and optimization. Students should already be familiar with the basics of computer architecture, operating systems, and software engineering. RA


270. Combinatorial Algorithms and Data Structures. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 170. Design and analysis of efficient algorithms for combinatorial problems. Network flow theory, matching theory, matroid theory, and network optimization. Efficient data structure techniques for efficient implementation of combinatorial algorithms; analysis of data structures; applications of data structure techniques to sorting, searching, and geometric problems. Staff

271. Randomness and Computation. (3) Three hours of lecture per week. Prerequisites: 170 and at least one course numbered 270-279. Computational applications of randomness and computational theories of randomness. Approximate counting and uniform generation of combinatorial objects, random convergence of random walks on expander graphs, random constraints, randomized reductions, Kolmogorov complexity, pseudorandom number generation, semi-random sources. Sinclair


274. Computational Geometry. (3) Course may be taken for graduate credit. Three hours of lecture per week. Prerequisites: 170 or equivalent. Formerly 262GT. Constructive problems in computational geometry: convex hulls, triangulations, Voronoi diagrams, arrangements of hyperplanes, Voronoi diagrams, polytopes, convex hulls, convex hulls. Search problems: advanced data structures; subdivision search; various kinds of range searches. Models of computation; lower bounds. Shewchuk

276. Cryptography. (3) Three hours of lecture per week. Prerequisites: 170. Graduate survey of modern cryptography. One-way functions; pseudo-randomness; encryption; authentication; public-key cryptosystems; notions of security. May also cover elliptic curve cryptography and applications of modern cryptography. (SP) Trivison, Wagner

278. Machine-Based Complexity Theory. (3) Three hours of lecture per week. Prerequisites: 170. Properties of abstract complexity measures; Determinism vs. nondeterminism; time vs. space; complexity hierarchies; aspects of the P-NP question; relative power of various abstract machines. Trevisan


281A. Statistical Learning Theory. (3) Three hours of lecture per week. Prerequisites: Linear algebra, calculus, basic probability, and statistics, algorithms. Recommended 289. Classification regression, clustering, dimensionality reduction, and density estimation. Mixture models, hierarchical models, factor models, hidden Markov, and state space models, Markov properties, and recursive algorithms for general probabilistic inference nonparametric methods including decision trees, kernal methods, neural networks, and wavelets. Ensemble methods. Also listed as Statistics C241A. (F) Bartlett, Jordan, Wainwright


282. Algebraic Algorithms. (3) Three hours of lecture per week. Prerequisites: 164. Mathematics 113B, or permission of instructor. Theory and construction of algebraic computer programs. Polynomial arithmetic, GCD, factorization, integration of elementary functions, analytic approximation, simplification, design of computer systems and languages for symbolic manipulation. Fateman

283. Advanced Computer Graphics Algorithms and Techniques. (4) Three hours of lecture per week. Prerequisites: 184 or equivalent. This course provides a graduate-level introduction to advanced computer graphics algorithms and techniques. Students should already be familiar with advanced computer graphics algorithms and techniques. RA

284. Computer-Aided Geometric Design and Mod- eling. (3) Three hours of lecture per week. Prerequisites: Mathematical skills through calculus. Mathematical techniques for curve and surface representation, including: Hermite interpolation, interpolatory splines, tensioned splines, Bezier curves and surfaces, B-splines. B-spline variations include row-splines, tensor product forms, as well as subdivision end/bounding conditions, and computational considerations. Barsky, Sequin

285. Solid Free-Form Modeling and Fabrication. (3) Three hours of lecture per week. Prerequisites: 276 and 293. From scanned data to part description formats. Algorithms suitable for manufacturing or rapid prototyping. Solid modeling techniques and procedural shape generation. Effective data structures and unambiguous part description formats. Algorithms dealing with Boolean operations and for machine tool path planning. Problems of finite-precision geometry and machining tolerances. Introduction to some rapid prototyping techniques based on Solid Free-Form Fabri-
288. Artificial Intelligence Approach to Natural Language Processing. (3) Three hours of lecture per week. Prerequisites: 124. Representation of conceptual structures, language analysis and production, models of inference and memory, high-level text structures, question answering and conversation, machine translation. (F,SP)

294. Special Topics. (1-4) Course may be repeated for credit. Topics vary from semester to semester. See Computer Science Division announcements.

299. Field Studies in Computer Science. (1-12) Course may be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Supervised experience in off-campus companies relevant to specific aspects and applications of electrical engineering and/or computer science. Written report required at the end of the semester. (F,SP)

298. Group Studies Seminars, or Group Research. (1-4) Course may be repeated for credit. One or four hours per unit. Sections 1-25 to be graded on a satisfactory/unsatisfactory basis. Sections 26-35 to be graded on a letter-grade basis. Advanced study in various subjects through seminars on topics to be selected each year, informal group studies of special problems, group participation in comprehensive design problems, or group research on complete problems for analysis and experimentation. (F,SP) Staff

299. Individual Research. (1-12) Course may be repeated for credit. Independent study, consultation with faculty member. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various specializations leading to Ph.D. (and other doctoral degrees). (F,SP) Staff

300. Teaching Practice. (1-6) Course may be repeated for credit. Three to 20 hours of discussion and consulting per week. Must be taken on a satisfactory/unsatisfactory basis. Supervised teaching practice, in either a non-credit seminars or classroom discussion setting. (F,SP) Staff

301. Teaching Techniques for Computer Science. (2) Course may be repeated for credit. Three hours of discussion for ten weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Discussion and practice of techniques for effective teaching, focusing on issues most relevant to teaching assistants in computer science courses. (F,SP) Barsky, Garcia, Harvey

302. Designing Computer Science Education. (3) Two hours of lecture per week. Prerequisites: Computation and NICmachining. Other advanced topics and recent developments in the field. Sequin

286. Implementation of Data Base Systems. (3) Three hours of lecture per week. Prerequisites: 162 and 186. Implementation of data base systems on modern hardware. Considerations concerning operating system design, including buffering, page size, prefetching, etc. Query processing algorithms, design of crash recovery and concurrency control systems. Implementation of distributed data bases and data base machines. Franklin, Hellerstein


290. Curriculum and Topic Organization, Evaluation, Collaboration, and Team Success. (3) Three hours of lecture per week. Prerequisites: Admission by petition. Evaluation and implementation of various teaching methodologies and strategies, individualized and small group teaching. Workshop participation. Cooperative formation and critical evaluation of course materials and teaching methods (F,SP)

Endocrinology
(College of Letters and Science)

Group Office: 299 Life Science Addition (LSA), (510) 643-7330
endo.berkeley.edu
Chair: Gary L. Firestone, Ph.D.

Professors
Gregory Aponte, Ph.D. Regulation of epithelial cell motility and differentiation by neuropeptides (Nutritional Science and Toxicology)
George E. Bentley, Ph.D. Avian reproductive biology, neuroendocrinology, and behavior (Integrative Biology)
Gary Firestone, Ph.D. Molecular endocrinology: hormonal control of cell growth and differentiation (Cell and Developmental Biology)
Stephen E. Glickman, Ph.D. Neuronal and endocrine bases of species-specific behavior (Integrative Biology)
Tyrone B. Hayes, Ph.D. Amphibian developmental endocrinology (Integrative Biology)
Marc Helterman, Ph.D. Intracellular metabolic processes (Nutritional Science and Toxicology)
Salyabara Nandi, Ph.D. Hormones and growth, differentiation, and cancer (Cell and Developmental Biology)
Hei-Sook Sul, Ph.D. Hormonal regulation of lipid metabolism and adipocyte differentiation (Nutritional Science and Toxicology)
Irving J. Zucker, Ph.D. Seasonal reproductive cycles; biological clocks; neuroendocrine-behavior relations (Psychology)
Howard A. Bern, Emeritus, Ph.D.
Paul Licht, Emeritus, Ph.D.
David L. Wood, Emeritus, Ph.D.

Assistant Professor
Gertrude C. Buchring, Ph.D. Endocrinology and prevention of breast cancer (Public Health and Epidemiology)

Assistant Professors
Danielle Kaufer, Ph.D. Stress and steroid hormones effects on the brain (Integrative Biology)
Lance J. Krieg, Ph.D. Neuroendocrinology, reproductive biology, and biological timing (Psychology)
Andrew Stahl, Ph.D. Neuroendocrinology of stress-related disorders (Nutritional Science and Toxicology)
Jen-Chyuan Wang, Ph.D. Mechanisms of glucocorticoid receptor-regulated metabolism (Nutritional Science and Toxicology)

Adjunct Assistant Professor
Dale Leitman, Ph.D. Toxicology receptor biology and drug discovery (Nutritional Science and Toxicology)

Principal Scientist
Mina Bissell, Ph.D. Regulation of tissue-specific gene expression by extracellular matrix and cell-cell interactions (Life Sciences Division, LBNNL)

The Graduate Program
The faculty associated with the Graduate Group in Endocrinology leading to the M.A. and the Ph.D. degrees have diverse interests representing endocrinology in the broadest sense: chemical mediators of the living world such as steroids, paracrine, endocrine, and endochromosomal factors. The major goal of our program is to engage students in the interdisciplinary aspects of the field of endocrinology through seminars, courses, and our diverse faculty research perspectives that range from structural, molecular, and cellular endocrinology through organ and organ systems.
Lynn Hunttinger, Ph.D. (Environmental Science, Policy, and Management)
Judith Innis, Ph.D. (City and Regional Planning)
Robert Kagan, Ph.D. (Political Science)
Larry Klein, Ph.D. (Public Policy/Environmental Economics)
William Kamberg, Ph.D. (Nuclear Engineering)
Jim Killian, Ph.D. (Biological Sciences/Plant Sciences)
G. Mathias Kondolf, Ph.D. (Landscape Architecture)
*Alan Lichtenberg, Ph.D. (Electrical Engineering and Computer Science)
Carolyn Merchant, Ph.D. (Environmental Science, Policy, and Management)
Craig Moitz, Ph.D. (Integrated Biology)
Michael N. Train, Ph.D. (Public Policy)
Laura Nader, Ph.D. (Anthropology)
William Nazzaro, Ph.D. (Civil and Environmental Engineering)
Michael O’Hare, Ph.D. (Public Policy)
Nancy Peluso, Ph.D. (Public Policy)
Per Peterson, Ph.D. (Nuclear Engineering)
Thomas Zaki, Ph.D. (Integrated Biology)
Mary Power, Ph.D. (Biological Integrated)
Jeffrey Romm, Ph.D. (Environmental Science, Policy, and Management)
*Ananya Roy, Ph.D. (City and Regional Planning)
Richard Sawyer, Ph.D. (Mechanical Engineering)
AnnaLee Saxenian, Ph.D. (City and Regional Planning)
Whendee Silver, Ph.D. (Environmental Science, Policy, and Management)
Eileen Simms, Ph.D. (Biological Integrated)
Kirk Smith, Ph.D. (Public Health)
David Teese, Ph.D. (Business Administration)
Praveen Varaiya, Ph.D. (Electrical Engineering and Computer Science/Economics)
David Vogel, Ph.D. (Business, Public Policy)
Jasmina Vujic, Ph.D. (Nuclear Engineering)
Michael Wolfs, Ph.D. (Archaeology)
Eike Weber, Ph.D. (Materials Science and Engineering)
Steven Weber, Ph.D. (Political Science)
Jennifer Wolch, Ph.D. (City and Regional Planning)
Brian D. Wright, Ph.D. (Agricultural and Resource Economics)
Paul K. Wright, Ph.D. (Mechanical Engineering)
David Zilberman, Ph.D. (Agricultural and Resource Economics)
John Zepp, Ph.D. (Political Science)
†John P. Holdren, Ph.D. (Energy and Resources Emeritus), Ph.D.
†Kenneth Jewett (Political Science Emeritus), Ph.D.
†Todd Katz, Ph.D. (Biological Sciences Emeritus), Ph.D.
Gene I. Rochlin (Energy and Resources Group Emeritus), Ph.D.
†Joseph Sax (Law Emeritus), J.D.
*Oliver Williamson, Ph.D. (Business Economics/Law Emeritus), Ph.D.
David Winicoff (Environmental Science, Policy, and Management)
†Maximilian Auffhammer, Ph.D. (Agricultural and Resource Economics)
Ellen Snyder, Ph.D. (Environmental Science, Policy, and Management)
Claudia Carr, Ph.D. (Environmental Science, Policy, and Management)
Cathryn Carson, Ph.D. (History)
Jamie Cate, Ph.D. (Molecular and Cell Biology)
I. Ignacio H. Chapela, Ph.D. (Environmental Science, Policy, and Management)
Jason Corburn, Ph.D. (City and Regional Planning)
Arthur Coxe, Ph.D. (Biological Engineering and Environmental Engineering)
Claire Kremen, Ph.D. (Environmental Science, Policy, and Management)
Rachel Morell-Frosch, Ph.D. (Environmental Science, Policy, and Management)
Kate Nelson, Ph.D. (Environmental Science, Policy, and Management)
Kate O’Neill, Ph.D. (Environmental Science, Policy, and Management)
Dara O’Rourke, Ph.D. (Environmental Science, Policy, and Management)
Christine Rosen, Ph.D. (Business)
Catherine Wolffram, Ph.D. (Business)

Assistant Professors
Eric Bjerre, J.D. (Law and Public Policy)
Lucas W. Davis, Ph.D. (Business)
Meredith Foxwell-Nichols, Ph.D. (Agricultural and Resource Economics)
Alastair Illes, Ph.D. (Environmental Science, Policy, and Management)
Ann Keller, Ph.D. (Public Health)
Alexander Post, Ph.D. (Population Science)
Robert Rhew, Ph.D. (Physical Geography)
Nathan Sayre, Ph.D. (Environmental Science, Policy, and Management)
Margaret Taylor, Ph.D. (Public Policy)

Adjunct Professors
Thomas E. McKone, Ph.D. (Public Health)
David Roland-Holst, Ph.D. (Agricultural and Resource Economics)
Kenneth A. Schmidt, Ph.D. (Economics)

Professor-in-Residence
William Collins, Ph.D. (Earth and Planetary Science; Lawrence Berkeley National Laboratory)

Research Attitudees
William Avrin (California State Coastal Conservancy)
Susan Anderson, Ph.D. (Rutger Marine Laboratory)
Sarah Benson, Ph.D. (Lawrence Berkeley National Laboratory)
Samuel Berman, Ph.D. (Lawrence Berkeley National Laboratory)
Carl Bledsoe, Ph.D. (University of California Energy Institute)

B prefix=language course for business majors
C prefix=language course for computer science majors
D prefix=diploma course
H prefix=honors course

Program Overview
The Energy and Resources Group (ERG) is an interdisciplinary unit of the University of California, Berkeley, conducting programs of graduate teaching and research that treat issues of energy, resources, development, human and biophysical diversity, environmental justice, governance, global climate change, and new approaches to thinking about economics and consumption. Established in 1973, ERG offers two-year M.A. and M.S. degrees in energy and resources, as well as a Ph.D. and an undergraduate minor.

Faculty. The faculty of ERG consists of six professors of energy and resources plus some 10 other affiliated faculty members whose main appointments span all five colleges and four of the schools of the campus; as well as the University’s Lawrence Berkeley and Lawrence Livermore National Laboratories. The chair is normally drawn on a rotating basis from the affiliated faculty.

Students. There are approximately 60 graduate students earning M.A. and M.S. degrees and 12 Ph.D. students organization. The students come from a wide variety of backgrounds—engineering, natural sciences, social sciences, and humanities. The character of the programs are, in common, an interest in interdisciplinary approaches to energy and resource issues and the intellectual credentials to succeed in a rigorous academic pro-

All receive training at ERG in the technological, environmental, economic, and sociopolitical dimensions of energy and resource issues with substantial additional coursework and individual research tailored to their interest and backgrounds.

Graduates. ERG graduates are employed across the United States and around the world in universities, governmental and international agencies, legislative staff offices, national laboratories, public and private utilities, other energy and resource companies, consulting firms, and public-interest organizations.

Undergraduate Courses. The undergraduate courses in ERG deal with the essence of energy and resource issues on both a national and global level in their technical, environmental, sociopolitical, and economic aspects. The courses provide both basic surveys of the field and introductory training in interdisciplinary research methods. There are no prerequisites for enrollments in the courses unless specifically noted otherwise in the descriptions below. Additionally, ERG offers an undergraduate minor in the field of energy and resources.

Graduate Courses. The graduate courses in ERG provide advanced training in interdisciplinary analysis and research. Individual courses review current developments in the field or emphasize particular disciplinary perspectives: economics, political science, sociology, environmental science, politics, public policy, or environmental sciences.

Admission. Applications are considered once a year for fall semester admission only. Continuing students are recommended for admission to the Ph.D. program upon completion of their master’s work.

Further Information. Contact the Energy and Resources Group, 310 Barrows Hall #3050, University of California, Berkeley, Berkeley, CA 94720-3050. (510) 642-1640; erg.berkeley.edu.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics may vary from department to department and semester to semester. (F,SP)

98. Directed Group Study for Lower Division Students. (1-4) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Lectures and small group discussions focusing on topics of interest that vary from semester to semester.

99. Directed Study. (1-4) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. "Directed Study" is a term used for undergraduate study not included in the regular calendar of courses.

100. Energy and Society. (4) Three hours of lecture and one hour of discussion per week. Energy sources, uses, and impacts; an introduction to the technology, economics, politics, social, and environmental effects of energy in contemporary society. Energy and well-being; energy in international perspective, origins, and character of energy crisis. (Kammen)

C100. Ethics and Renewable Energy. (1) Three hours of lecture and one hour of discussion per week. Energy sources,
uses, and impacts: an introduction to the technology, politics, economics, and environmental effects of energy in contemporary society. Energy and wellbeing; energy international perspective, origins, and character of energy crisis. Also listed as Public Policy C284. (F,SP) Kammen

200N. Energy and Society. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing. Formerly 200. Energy sources, uses, and impacts; an introduction to the technology, politics, economics, and environmental effects of energy in contemporary society. Energy and wellbeing; energy international perspective, origins, and character of energy crisis. (F) Kammen

201. Interdisciplinary Analysis in Energy and Resources. (3) Three hours of lecture per week. Prerequisites: Open to ERG graduate students only or consent of instructor. Introduction to interdisciplinary analysis as it is practiced in the ERG. Most of the course consists of important perspectives on energy and resource issues, introduced through a particularly influential book or set of papers. The course also provides an introduction to the current research activities of the ERG faculty as well as practical knowledge and tools. The course is also taught for credit and graduate students in an interdisciplinary program. (F) Harte, Kammen, Ray

175. Water and Development. (4) Four hours of seminar per week. Prerequisites: Upper division standing or consent of instructor. This course introduces students to water policy in developing countries. It is a course motivated by the fact that over one billion people in developing countries have no access to safe drinking water. The course also has some very well-nourished and abundant supplies, and many millions of small farmers do not have reliable water supplies to ensure a healthy crop.

101. Ecology and Society. (3) Three hours of lecture per week. Prerequisites: One college level course, or high school advanced placement, in either physics or biology. This course introduces students to the many ways in which our lives are intertwined with the ecosystems around us. Topics include ecological limits to growth; climate change and the role of the carbon cycle; the value of ecosystems and their goods and services; the ecology of disease; ecology and the evolution of cooperation in ecosystems; industrial ecology; and the epistemology of ecology. Offered again on a rotating basis.

102. Quantitative Aspects of Global Environmental Problems. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing; calculus (Math 1A-1B or 16A-16B); physics (7A-7B or 8A-8B), chemistry (1A or 4A), biology (1B or 11), or consent of instructor. Human disruption of biogeochemical and hydrological cycles; causes and consequences of climate change and acid deposition; transport and health impacts of pollutants; loss of species; radioactivity in the environment; epidemics. (SP) Harte

C130. Analysis of Environmental Data. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: One year of calculus or consent of instructor. Formerly 130. Fundamentals of exploratory data analysis and hypothesis testing for environmental scientists, with emphasis on characterizing and evaluating uncertainty. Introduction to selected topics relevant to environmental analysis, including error propagation, Monte Carlo methods. Microcomputer laboratories, using real environmental data, explore concepts and techniques presented in lecture. Also listed as Earth and Planetary Sciences C130. (F,SP) Staff

151. Politics of Energy and Environmental Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division or graduate standing; some coursework in social science and technical areas. How existing agencies and policy makers incorporate new concerns into their deliberations, and how agencies given the mandate to address the newer concerns seek to fold their priorities into the existing institutional and policy structures. (F) Staff

170. Environmental Classics. (3) Three hours of seminar per week. Prerequisites: Upper division standing or consent of instructor. Upper division standing; calculus (Math 1A-1B or 16A-16B); physics (7A-7B or 8A-8B), chemistry (1A or 4A), biology (1B or 11), or consent of instructor. Human disruption of biogeochemical and hydrological cycles; causes and consequences of climate change and acid deposition; transport and health impacts of pollutants; loss of species; radioactivity in the environment; epidemics. (SP) Harte

175. Water and Development. (4) Four hours of seminar per week. Prerequisites: Upper division standing or consent of instructor. This course introduces students to water policy in developing countries. It is a course motivated by the fact that over one billion people in developing countries have no access to safe drinking water. The course also has some very well-nourished and abundant supplies, and many millions of small farmers do not have reliable water supplies to ensure a healthy crop. Readings and discussions will cover the problems of water access and management in developing countries. The potential for technological, social, and economic solutions to these problems; the role of institutions in access to water and sanitation; and the pitfalls of the assumptions behind some of today’s popular “solutions.” (F) Ray

C180. Ecological Economics in Historical Context. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 100A or equivalent. Ecologists through an exploration of economic and environmental interactions, physical limits to growth, what constitutes the good life, and how economic justice can be assured. Yet ecologists continue to continue to struggle with these issues and promote bad outcomes. Ecological economics responds to this tension between the desire for simplicity and the multiple perspectives needed to understand complexity in order to move toward sustainable, fulfilling, just economies. Also listed as Environmental Economics and Policy C180. (SP) Norgaard

190. Seminar in Energy, Environment, Development and Security Issues. (3) Course may be repeated for credit. One to three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Critical, cross-disciplinary analysis of specific issues or general problems of how people interact with environmental and resource systems. More than one section may be given each semester on different topics depending on faculty and student interest. (F,SP) Staff

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a pass/not pass basis. Prerequisites: Upper division standing, plus particular courses to be specified by instructor. Group studies of selected topics. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a pass/not pass basis. Prerequisites: Enrollment restricted by regulations in this catalog. Individual conferences. (F,SP) Staff

Graduate Courses

C200. Energy and Society. (4) Three hours of lecture and one hour of discussion per week. Energy sources, uses, and impacts taken from the mathematical, economic, and environmental assumptions behind some of today’s popular “solutions.” (F) Ray

C218. Quantitative Methods for Ecological and Environmental Modeling. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course will review the background mathematical and statistical tools necessary for students interested in pursuing ecological and environmental modeling. Topics include linear algebra; difference equation, ordinary differential equation, and partial differential equation modeling; deterministic and stochastic simulation; and a number of statistical techniques. This course will be recommended as a prerequisite for advanced modeling courses in Integrative Biology, Environmental Resources, Environmental Science, Policy, and Management. Also listed as Environmental Science, Policy, and Management C205 and Integrative Biology C205. (F) Staff

220. Modeling Energy, Environmental, and Resource Systems. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Undergraduate standing of linear algebra and first-semester calculus (Math 54 or equivalent). Limited to seniors and graduate students. A first course in modeling with an emphasis on optimization analysis based in energy, environment, and resource management. Readings, lectures, homework, and small projects will be used to help understand the role of modeling in exploring a variety of questions associated with energy and resources. Course is based in Excel, both the native Solver module and the more powerful add-in OptQuest that is included with the textbook, so each student will be able to apply the learned skills in a wide variety of potential research and work environments. Goals: the student will be able to describe a problem from an optimization perspective, formulate the appropriate model, be able to implement the model on Excel, and examine the problem, solve the model, and interpret the results. Course provides the fundamental basis for more sophisticated modeling but does not cover algorithm implementations. (F) Staff

C226. Photovoltaic Materials; Modern Technologies in the Context of a Growing Renewable Energy Market. (3) Three hours of lecture per week. Prerequisites: Material Science and Mineral Engineering 111 or 123 or equivalent. Should have a firm foundation in electronic and semiconductor device physics. This technical course focuses on the fundamentals of photovoltaic energy conversion with respect to the physical principles of operation and design of efficient semiconductor solar cells. This course aims to equip students with the concepts and analytical skills necessary to assess the utility and viability of various modern photovoltaic technologies in the context of a growing global renewable energy market. Also listed as Materials Science and Engineering C226. (F) Kammen, Staff

254. Electric Power Systems. (3) Three hours of lecture per week. Prerequisites: Physics 7B or 8B or equivalent. Provides an understanding of the design and operation of electric power systems, including generation, transmission, and consumption. Covers basic electromagnetic physics, reactive power, power flow, and load analysis, reliability, planning, dispatch, organizational design, regulations, end-use efficiency, and new technologies. (SP) Staff

270. Environmental Classics. (3) Three hours of seminar per week. Prerequisites: Graduate standing. Motivation: What is the history and evolution of environmental thinking and writing? How have certain “environmental classics” shaped the way in which we think about nature, society, and development? This course uses a selection of readings and papers that have had a major impact on academic and wider public thinking about the environment and development to probe these issues. The selection of readings and papers is determined by the theme of the course and by the current context of environmental politics and policy in the United States as well as in the developing world. Through the classics and their critiques, reviews, and commentaries, the class will explore the evolution of thought on these transforming ideas. (F) Kammen, Ray

273. Research Methods in Social Sciences. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course aims to introduce graduate students to a variety of research methods that social scientists have
developed for the empirical aspects of their work. Its
primary goal is to encourage critical thinking about
the research process: how we "know", how we match
research methods to research questions; how we
design and conduct our information/data collection;
what we assume explicitly and implicitly; and the
difficulties and challenges associated with the
collected information.

(SP) Ray

275. Water and Development. (4) Four hours of lecture
and one hour of discussion per week. This class is
an interdisciplinary graduate seminar for students of
water policy in developing countries. It is not a seminar
on theories and practices of development through the
lens of water. Rather, it is a seminar motivated by the
fact that over 1 billion people in developing countries
have no access to safe drinking water, 3 billion don't
have sanitation facilities and many millions of small
farmers do not have reliable water supplies to ensure
a healthy crop. Readings and discussions will cover
the problems of water access and use in developing
countries; the potential for technological, social, and
economic solutions to these problems; the role of insti-
tutions in access to water and sanitation; and the pit-
falls of and assumptions behind some of today's
popular "solutions." (F) Ray

280. Energy Economics. (3) Three hours of lecture per
week. Prerequisites: Economics 100A or equiv-
alent. Input-output analysis of advanced topics in energy
and cost benefit analysis applied to energy; exhaustion
theory and economics of energy supply; patterns of
energy use; trade-offs in energy conservation; the
theory and economics of energy supply; patterns of
use. Specific topics vary from year to year accord-
ing to student and faculty interests. Course
must be taken on a satisfactory/unsatisfactory basis.

Staff

C283. Information and Communications Technol-
ology for Development. (3) Students will receive no
credit for Information C283 after taking Information
298. Lectures, reports, and discussions on current research in energy
and resources. Particular emphasis on topics of
research interest for current Ph.D. students in the
Energy and Resources Group. (F,SP) Staff

298. Doctoral Seminar. (2) Course may be repeated for credit.
Two hours of seminar per week. Must be taken on a
satisfactory/unsatisfactory basis. Prereq-
quiries: Consent of instructor. Formerly 298. Lectures,
reports, and discussions on current research in energy
and resources. Sections are operated independently and
under direction of different staff. (F,SP) Staff

298N. Directed Group Study. (1-3) Course may be repeated for credit.
One to three hours of directed
group study per week. Must be taken on a satisfac-
tory/unsatisfactory basis. Prerequisites: Graduate
standing and consent of instructor. (F,SP) Staff

299. Individual Research in Energy and Resources. (1-2) Course
may be repeated for credit. Variable. Prerequisites:
Graduate standing, investigation of problems in energy and
resources from an interdisciplinary perspective. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-4) Course
may be repeated for credit. Individual study.
Must be taken on a satisfactory/unsatisfactory basis.
Prerequisites: Consent of instructor. Individual study on
consultation with the major advisor, intended to provide
an opportunity for qualified students to prepare them-

29C-29D. Master's Project Seminar. (2;2) Two hours of seminar per week.
Credit and grade to be awarded upon completion of sequence.
Required of second-year Energy and Resources' students
as a part of the completion of a research pro-
ject, research design, presentation of work, statistical
analyses. Students will apply the interdisciplinary meth-
ods, approaches, and perspectives learned in the core
courses. Sequence should be taken in the second
year. Credit and grade to be awarded upon completion of the
full sequence. (F,SP) Staff

C293A. Technology and Sustainability. (2) One and one-half hours of lecture/seminar per week and
one hour of discussion every other week. Must be
taken on a satisfactory/unsatisfactory basis. Prereq-
quiries: Graduate standing or consent of instructor.
Assessment of the consequences and opportunities of
various technological systems (such as energy, build-
ings, transportation, materials, waste management)
for sustainable development of society. Political and
economic structures of societal decision making. Envi-
ronmental consequences of various technologies.
Metrics and measures. Specific topics vary from
year to year according to student and faculty interests.
Course includes a mix of faculty lectures and
student-led seminar presentations. Also listed as Civil
and Environmental Engineering C293A. (F) Gadjil,
Horvath, Nazaroff

295. Special Topics in Energy and Resources. (1) Course
may be repeated for credit. One and one-half
hours of lecture per week. Must be taken on a satis-
factory/unsatisfactory basis. Presentations of research
in energy issues by faculty, students, and visiting lec-
turers. Master's degree students required to enroll
for three semesters. (F,SP) Staff

296. Doctoral Seminar. (2) Course may be repeated for credit.
Two hours of section per week. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites:
Consent of instructor. Formerly 298. Lectures,
reports, and discussions on current research in energy
and resources. Particular emphasis on topics of
research interest for current Ph.D. students in the
Energy and Resources Group. (F,SP) Staff

298. Doctoral Seminar. (2) Course may be repeated for credit.
Two hours of section per week. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites:
Consent of instructor. Lectures, reports,
and discussions on current research in energy
and resources. Sections are operated independently and
under direction of different staff. (F,SP) Staff

298N. Directed Group Study. (1-3) Course may be repeated for credit.
One to three hours of directed
group study per week. Must be taken on a satisfac-
tory/unsatisfactory basis. Prerequisites: Graduate
standing and consent of instructor. (F,SP) Staff

299. Individual Research in Energy and Resources. (1-2) Course
may be repeated for credit. Variable. Prerequisites:
Graduate standing, investigation of problems in energy and
resources from an interdisciplinary perspective. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-4) Course
may be repeated for credit. Individual study.
Must be taken on a satisfactory/unsatisfactory basis.
Prerequisites: Consent of instructor. Individual study on
consultation with the major advisor, intended to provide
an opportunity for qualified students to prepare them-

29C-29D. Master's Project Seminar. (2;2) Two hours of seminar per week.
Credit and grade to be awarded upon completion of sequence.
Required of second-year Energy and Resources' students
as a part of the completion of a research pro-
ject, research design, presentation of work, statistical
analyses. Students will apply the interdisciplinary meth-
ods, approaches, and perspectives learned in the core
courses. Sequence should be taken in the second
year. Credit and grade to be awarded upon completion of the
full sequence. (F,SP) Staff

C293A. Technology and Sustainability. (2) One and one-half hours of lecture/seminar per week and
one hour of discussion every other week. Must be
taken on a satisfactory/unsatisfactory basis. Prereq-
quiries: Graduate standing or consent of instructor.
Assessment of the consequences and opportunities of
various technological systems (such as energy, build-
ings, transportation, materials, waste management)
for sustainable development of society. Political and
economic structures of societal decision making. Envi-
ronmental consequences of various technologies.
Metrics and measures. Specific topics vary from
year to year according to student and faculty interests.
Course includes a mix of faculty lectures and
student-led seminar presentations. Also listed as Civil
and Environmental Engineering C293A. (F) Gadjil,
Horvath, Nazaroff

295. Special Topics in Energy and Resources. (1) Course
may be repeated for credit. One and one-half
hours of lecture per week. Must be taken on a satis-
factory/unsatisfactory basis. Presentations of research
in energy issues by faculty, students, and visiting lec-
turers. Master's degree students required to enroll
for three semesters. (F,SP) Staff

296. Doctoral Seminar. (2) Course may be repeated for credit.
Two hours of section per week. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites:
Consent of instructor. Formerly 298. Lectures,
reports, and discussions on current research in energy
and resources. Particular emphasis on topics of
research interest for current Ph.D. students in the
Energy and Resources Group. (F,SP) Staff

298. Doctoral Seminar. (2) Course may be repeated for credit.
Two hours of section per week. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites:
Consent of instructor. Lectures, reports,
and discussions on current research in energy
and resources. Sections are operated independently and
under direction of different staff. (F,SP) Staff

298N. Directed Group Study. (1-3) Course may be repeated for credit.
One to three hours of directed
group study per week. Must be taken on a satisfac-
tory/unsatisfactory basis. Prerequisites: Graduate
standing and consent of instructor. (F,SP) Staff

299. Individual Research in Energy and Resources. (1-2) Course
may be repeated for credit. Variable. Prerequisites:
Graduate standing, investigation of problems in energy and
resources from an interdisciplinary perspective. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-4) Course
may be repeated for credit. Individual study.
Must be taken on a satisfactory/unsatisfactory basis.
Prerequisites: Consent of instructor. Individual study on
consultation with the major advisor, intended to provide
an opportunity for qualified students to prepare them-

29C-29D. Master's Project Seminar. (2;2) Two hours of seminar per week.
Credit and grade to be awarded upon completion of sequence.
Required of second-year Energy and Resources' master's candi-
dates. Topics include the completion of a research pro-
ject, research design, presentation of work, statistical
analyses. Students will apply the interdisciplinary meth-
ods, approaches, and perspectives learned in the core
courses. Sequence should be taken in the second
year. Credit and grade to be awarded upon completion of the
full sequence. (F,SP) Staff

C293A. Technology and Sustainability. (2) One and one-half hours of lecture/seminar per week and
one hour of discussion every other week. Must be
B.A. in operations research and management science (offered through the College of Letters and Science)

Graduate Programs:

• M.S., Ph.D. in industrial engineering and operations research

Department of Materials Science and Engineering

Undergraduate Program:

• B.S. in materials science and engineering

Graduate Programs:

• M.S., Ph.D. in materials science and engineering

Department of Mechanical Engineering

Undergraduate Programs:

• B.S. in mechanical engineering

Graduate Programs:

• M.S., Ph.D. in mechanical engineering

Department of Nuclear Engineering

Undergraduate Programs:

• B.S. in nuclear engineering

Graduate Programs:

• M.S., M.Eng., Ph.D. in nuclear engineering

Other Programs

Applied Science and Technology Graduate Program

• M.S., Ph.D. in applied science and technology

Engineering—Undeclared

Engineering Science

• B.S. in engineering mathematics and statistics

• B.S. in environmental science

• B.S. in environmental engineering science

Coleman Fung Institute for Engineering Leadership

• Center for Entrepreneurship and Technology Program (Undergraduate)

• Berkeley Engineering Professional Master’s Program (Graduate, degree in conjunction with departments)

• Certificate in Management of Technology (Graduate)

Joint Major Programs (Undergraduate)

• B.S. in bioengineering and materials science and engineering

• B.S. in chemical engineering and materials science and engineering (offered through the College of Chemistry)

• B.S. in chemical engineering and nuclear engineering (offered through the College of Chemistry)

• B.S. in electrical engineering and computer sciences, problem materials science and engineering

• B.S. in electrical engineering and computer sciences and nuclear engineering

• B.S. in materials science and engineering and mechanical engineering

• B.S. in materials science and engineering and nuclear engineering

• B.S. in mechanical engineering and nuclear engineering

Concurrent Degree Programs (Graduate)

• M. Arch/M.S. in architecture and civil and environmental engineering

• M.C.P./M.S. in city and regional planning and civil and environmental engineering

• M.P.P./M.S. in public policy and either civil and environmental engineering, electrical engineering and computer sciences, industrial engineering and operations research, materials science and engineering, mechanical engineering, or nuclear engineering

Other Sections of Interest

Chemical Engineering (College of Chemistry)

Nanoscale Science and Engineering

Studies in Engineering, Science, and Mathematics Education (School of Education)

Undergraduate Programs

The College of Engineering’s Bachelor of Science programs are designed to equip graduates with a full command of engineering practice and the tools to become leaders in their chosen profession. The lower division curriculum emphasizes foundations in mathematics, science, and engineering, leading to more focused upper division coursework in one of the engineering programs and, in many cases, specific specializations or emphases within the program. The curriculum also calls for study of the humanities and social studies to supply additional skills needed to compete in a global economy.

Degree Requirements. Students must complete a minimum of 120 units, in which they must satisfy the University of California and Berkeley campus requirements outlined in this catalog. In addition, students must complete the requirements for the College of Engineering and for one B.S. program. Full details on these requirements can be found in the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study available at coe.berkeley.edu/college-of-engineering-announcement.

Accreditation. The following programs are accredited by the Engineering Accreditation Commission of ABET:

- Civil and Environmental Engineering
- Materials Science and Engineering
- Mechanical Engineering
- Nuclear Engineering

In addition, the computer science and engineering program is accredited by the Computing Accreditations Commission of ABET, Inc.

Undergraduate Admission. The College of Engineering accepts applicants at the freshman and junior transfer levels. Students interested in applying to the College of Engineering should follow the procedures outlined in the Undergraduate Education section of this catalog. Additional information on the college can be found on the College of Engineering Prospective Students web page at coe.berkeley.edu/prospective-students.

College of Engineering applicants are admitted directly to one of the Bachelor of Science programs (see Overview of the College above), and are therefore encouraged to explore the resources in this catalog and online to carefully evaluate their interests before applying. Freshman applicants who are unsure of which engineering field to study may apply to the Engineering—Undeclared Program. For further details on this program, see the Engineering—Undeclared section of this catalog. Historically, the undeclared program admits only from the strongest applicants to the College of Engineering; admission to this program is generally more competitive than admission to other engineering majors. Applicants who know which field of engineering they wish to study should apply to that major.

Graduate Programs

The College of Engineering offers Master of Science, Master of Engineering, and Doctor of Philosophy degrees. See Overview of the College (on page 251) or the appropriate section in this catalog for your department of interest for information on specific degrees awarded by department. The Master of Science and Doctor of Philosophy degrees emphasize engineering and applied sciences, while the Master of Engineering degree program emphasizes advanced professional studies.

Degree Requirements. Graduate students must follow the degree and scholarship requirements outlined in the Graduate Education section of this catalog and in the Graduate Division’s Guide to Graduate Policy available at grad.berkeley.edu/policies.

Graduate Admission. Interested applicants should follow the procedures outlined in the Graduate Education section of this catalog and on the website of your department or program of interest for further details.

Lower Division Courses

5. Solid-State Science for Engineers. (4) Three hours of lecture, two hours of laboratory, and one hour of discussion per week. This course introduces the fundamental principles of solid-state chemistry associated with the behavior of real materials used in engineering practice. It formulates the critical inter-relationships among scientific concepts needed by engineers to understand the internal structure of crystals and amorphous solids exhibiting metallic, ceramic, semiconducting, and/or polymeric properties. (F,SP) Devine

7. Introduction to Computer Programming for Scientists and Engineers. (4) Two hours of lecture, one hour of discussion, and four hours of laboratory per week. Prerequisites: Mathematics 1B (maybe taken concurrently). Formerly 77. Elements of procedural and object-oriented programming. Induction, iteration, and recursion. Real functions and floating-point computations for engineering analysis. Introduction to data structures. Representative examples are drawn from mathematics, science, and engineering. The course uses the MATLAB programming language. Sponsoring departments: Civil and Environmental Engineering and Mechanical Engineering. (F,SP) Staff

10. Engineering Design and Analysis. (3) Three hours of lecture and three hours of laboratory per week. This is an introduction to the profession of engineering and the different fields of study in the College of Engineering, through a variety of modular design and analysis projects. The emphasis is on hands-on creative components, teamwork, and effective communication. Common lecture sessions during the first three weeks of the semester will address ethics and societal context for engineering projects, introduction to engineering design process, and introduction to engineering analysis. Development of spatial reasoning will take two six-week modules involving both lectures and laboratories in which they will learn design and analysis skills, and will apply these skills to illustrate problems drawn from various engineering majors. (F,SP) Staff

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of lecture/discussion/seminar per week. Sections 1-3 to be graded on a letter-grade basis, Sections 4-6 to be graded on a pass/not passed basis. The Freshman Seminar Program is designed to provide students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all college departments, and topics vary from department to department and semester to semester. (F,SP)

28. Basic Engineering Design Graphics. (3) Two hours of lecture and three hours of laboratory per week. Introduction to the engineering design process and graphical communications tools used by engineers. Conceptual design of products. Tolerance analysis for fabrication. Documentation of design through engineering drawing. Development of graphical communication skills. Basic descriptive geometry. Parametric solid modeling and feature-based design. Use of computer-assisted design as a design tool. (F,SP) Liu
a passed/not passed basis. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small and informal setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP) Staff

45. Properties of Materials. (3) Three hours of lecture per week and two hours of laboratory on alternate weeks. Prerequisites: Physics 7A. Application of basic principles of physics and chemistry to the engineering properties of materials. Special emphasis devoted to relating the microstructure and the mechanical properties of metals, concrete, polymers, and ceramics, and the electrical properties of semiconductor materials. Sponsoring department: Materials Science and Engineering (F,SP) Staff

47. Supplementary Work in Lower Division Engineering. (1-3) Course may be repeated for credit. Prerequisites: Limited to students who must make up a fraction of a required lower division course. May be taken only with permission of the dean of the College of Engineering. Students with partial credit in a lower division engineering course may complete the work under this heading. (F,SP) Staff

92. Perspectives in Engineering. (1) Course may be repeated for credit. One hour of lecture per week. Must be taken on a passed/not passed basis. This series of lectures provides students, especially engineering undeclared students, with information on the various engineering disciplines to guide them toward choice of major. Lecturers describe research activities that interested them. They make their own career choices and indicate future opportunities. Recommended for all engineering science students and required for engineering undeclared students. (F) Staff

98. Directed Group Studies for Lower Division Undergraduates. (1-3) Course may be repeated for credit. Format varies with offering. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Seminars for group study of selected topics, which will vary from year to year. Intended for students in the lower division. (F,SP) Staff

Upper Division Courses

115. Engineering Thermodynamics. (4) Students will receive no credit for Engineering 115 after taking Mechanical Engineering 105 or Chemical Engineering 141. Four hours of lecture per week. Prerequisites: Physical Chemistry 13 or Engineering Chemistry 19 recommended. Fundamental laws of thermodynamics for simple substances; application to flow processes and to nonreacting mixtures; statistical thermodynamics of ideal gases and crystals; chemical and materials thermodynamics; multiphase and multicomponent equilibrium in reacting systems; electrochemistry. Sponsoring department: Materials Science and Engineering; Nuclear Engineering. (F) Glaeser, Olander

117. Methods of Engineering Analysis. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics S3, 54. Methods of theoretical engineering analysis; techniques for analyzing partial differential equations and the use of special functions related to engineering systems. Sponsoring department: Mechanical Engineering. (F) Staff

120. Principles of Engineering Economics. (3) Students will receive 2 units for 120 after taking Civil Engineering 167. Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of 60 units or permission of the engineering curriculum. Economic analysis for engineering decision making; capital flows, effect of time and interest rate. Different methods of evaluation of alternatives. Minimum-cost life methods. Depreciation and asset valuation. Depreciation and annuity tables. Discounting methods. Capital sources and their effects. Economic studies. (F,SP) Adler

128. Advanced Engineering Design Graphics. (3) Two hours of lecture and three hours of laboratory per week. Advanced graphics tools for engineering design. Parametric solid modeling. Assembly modeling. Presentation using computer animation and multimedia techniques. (F,SP) Lieu

147. Supplementary Work in Upper Division Engineering. (1-3) Course may be repeated for credit. Prerequisites: Limited to students who must make up a fraction of a required upper division course. May be taken only with permission of the dean of the College of Engineering. Students with partial credit in an upper division engineering course may complete the work under this heading. (F,SP) Staff

177. Advanced Programming with MATLAB. (3) Three hours of lecture and one voluntary discussion/computer laboratory per week. Prerequisites: 7 or 77; Mathematics 53 and 54 (one of these may be taken concurrently). An upper division course building on understanding, demonstrates engineering uses, and provides hand-on experience for object-oriented programming as well as exposing a practical knowledge of advanced features available in MATLAB. The course will begin with a brief review of basic MATLAB features and quickly move to class organization and functionality. The introduced concepts are reinforced by examining the advanced graphical features of MATLAB. The material will also include the effective use of programs written in C and FORTRAN, and will cover SIMULINK, a MATLAB toolbox providing for an effective way of model simulations. Throughout the course, one hour and three hours of laboratory per week. (F) Frenklach, Packard

193. California Engineer. (1) Course may be repeated once for credit. Three hours of laboratory per week. Must be taken on a passed/not passed basis. Work on the California Engineer magazine, in one or more of the following capacities: read candidate articles, edit articles, enter articles into UNIX computer system for typesetting, draw technical illustrations, photograph layout, issue layout, issue paste-up, write articles on assignment, accounting, advertising sales, public relations. Sponsoring department: Electrical Engineering and Computer Science. (F,SP) Staff

198. Directed Group Studies for Advanced Undergraduates. (1-3) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing, plus particular coursework or topic by instructor. Group study of selected topics. (F,SP) Staff

Graduate Courses

201. Ocean Engineering Seminar. (2.3) Two hours of lecture or two hours of lecture and one hour of consultation per week. Prerequisites: Enrollment in Ocean Engineering Master of Engineering Program or consent of instructor. Lectures on new developments in engineering and physical sciences to a range of methods to current problems of fluid dynamics, including compressible and incompressible flow. Sponsoring department: Mechanical Engineering. (F,SP) Staff

271. Engineering Leadership I. (3) Three hours of lecture per week. Prerequisites: Admission to the M.Eng. Program. Designed for newly-oriented engineering graduate students, this course explores key management and leadership concepts relevant to technology-dependent enterprises. Topics include corporate recognition, strategic planning and planning of R and D, marketing innovation, disruption, cognitive inertia, product management, market selection, standards wars, two-sided markets, attracting stakeholders, business models, pricing strategies. (F) Sidhu, Staff

272. Engineering Leadership II. (3) Three hours of lecture per week. Prerequisites: M.Eng. Program and 271. Designed for professionally-oriented engineering graduate level students, this course explores key operational, leadership, and financial concepts relevant to technology-dependent enterprises. Topics include methods to go to market, direct and indirect sales, logistics, talent management, managing creativity, project management, leadership styles, C.O.O.-style interpretation and hire, interaction with fund providers, and matching capital funding sources, budgeting, and valuation methods. (SP) Sidhu, Staff

C282. Charged Particle Sources and Beam Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course covers the physics and technology of various types of ion and electron sources, extraction and formation of charge particle beams, computer simulation of beam propagation, diagnostic equipment, and sources of violent interactions of beams in fusion, synchrotron light source, neutron generation, microelectronics, lithography, and medical therapy. This is a general accelerator technology and engineering course that will appeal to graduate students in physics, electrical engineering, and nuclear engineering. Also listed as Nuclear Engineering C282. (F,SP) Leung, Steier
290. Special Topics in Management of Technology. (2,3) Course may be repeated for credit as topic varies. Two to three hours of lecture per week. Prerequisites: Undergraduate standing. Special topics hours and units of credit will vary from section to section, year to year. Courses are related classes in the Management of Technology Certificate Program. (F,SP) Staff

290A. Introduction to Management of Technology. (2) Three hours of lecture/discussion per week. This course is designed to give students a broad overview of the main topics encompassed by management of technology. It includes the full chain of innovative activities involved in research and development and extending through production and marketing. Why do many existing firms fail to incorporate new technology in a timely manner? At each stage of innovation, we evaluate the potential of determining the value of management of technology. What constitutes a successful technology strategy? The integrating course focus will be on the emergence of the knowledge economy and technology as a key knowledge asset and will involve both general readings and cases. The course also introduces students to Haas and COE faculty working in the relevant areas. (SP) Proctor

290B. Biotechnology: Industry Perspectives and Business Development. (2) Students will receive no credit for 290B after taking Master of Business Administration 290B or Evening & Weekend Master of Business Administration 290B. Two hours of lecture per week. This course is designed to examine the strategic issues and the value creation of the development stage biotech company, i.e., after its start-up via an initial capital infusion, but before it might be deemed successful (e.g., by virtue of a product launch), or otherwise has achieved “first-tier” status. Thus, the intention is to study the biotech organization during the process of its growth and maturation from an early stage existence through “adolescence” into an “adult” company. The focus of the class will be on business development, i.e., the deal making that must occur to accomplish the corporate objectives of bringing in new technologies and getting the initial products to market. We will explore the critical deal issues from both the perspective of the development stage company and the viewpoint of the larger, more mature biotech or big pharma company with which it seeks to partner. (F) Hoover, Sanders

290C. Sustainable Manufacturing. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Sustainable manufacturing is a poorly understood idea and one that is not intuitively connected to business value or engineering practice. This project-oriented class will cover the material aspects of the role that manufacturing will play in making America competitive in the 21st century. We will emphasize the importance of sustainability thinking, techniques, and tools for product and manufacturing process design; and (3) the techniques for and value of effective communication of sustainability performance to internal and external audiences. Materials and case studies will be supplemented by speakers with diverse backgrounds in corporate sustainability, environmental-governmental regulations, and academia. Discussions of papers in the reader including case studies will be used to illustrate topics. A series of small projects is used throughout the semester and a final class project will be required, with students working individually or in small groups. Cross functional groups including students from different disciplines or backgrounds are encouraged. (F,SP) Donfli

290E. Marketing Emerging Technologies. (3) Students will receive no credit for 290E after taking Master of Business Administration 290E. Three hours of lecture per week. The primary goal of this course is to develop in the student the marketing skills needed to compete aggressively and successfully in a rapidly changing technology field. Upon completion of the course, the student should have developed the following skills: the ability to assess and predict customer needs in markets that may not yet exist; the ability to create and execute marketing plans that necessarily incorporate sophisticated technological development with rapidly evolving markets; the ability to create and manage a focused marketing organization rapidly and efficiently; and the ability to create and use market communications to reach prospects, customers, OEs, and sales channels efficiently and inexpensively. (F) Isaacas

290G. International Trade and Competition in High Technology. (3) Students will receive no credit for 290G after taking Master of Business Administration 290G. Two hours of lecture per week. This course will provide students with an overview of the global and prospective recovery of U.S.-high technology industries, the evolution of innovation and technology strategies and policies in Western Europe and Asia, the historic and current forces shaping international markets for high-technology goods, and the impact on business strategies of recent developments in early-stage capital markets. Our general approach views technological innovation and competition as dynamic processes that reflect previous choices made by firms and governments. Modern technologies develop in markets that are international in scope, often difficult to control, and frequently overlapping. (F,SP) Wu

290H. Management of Technology—Doing Business in China. (2) Students will receive no credit for 290H after taking Master of Business Administration 290H. Two hours of lecture per week. This course prepares students to find a startup business in China or to work with an MNC in China, develops their critical analytical and strategic decision tools and skills needed to compete in the world’s most dynamic emerging market, and provides access and useful introductions/Guam to aid future business development in China. (F,SP) Sanderson

290L. Managing Innovation and Change. (3) Three hours of lecture/discussion per week. Most innovations fail, yet companies that don’t innovate die. Managing innovation thus constitutes one of the most important strategic tasks facing a manager. Nor is it solely the concern of high tech companies—companies in traditionally “low tech” businesses such as consumer packaged goods (like Procter & Gamble) or retail sales (like Wal-Mart) also must grow and compete in new businesses, and better profits in existing ones. This course adopts a capabilities-based view of the firm, drawing from economic, organizational, and engineering approaches. The course is intended to identify the sources of innovative success and failure inside corporations, and how companies can develop and sustain a capability to innovate. (SP) Chesbrough

290J. Entrepreneurship in Biotechnology. (2) Two hours of lecture/discussion per week. This course will provide students an introduction to the complexities and unique problems of starting a life sciences company. It is designed for both entrepreneurs and students who may someday work in a biotechnology or related environment. The course will cover the topics most critical for successfully founding, financing, and operating a life science company, and will be expected to perform many of the same tasks that founders would normally undertake. Discussions with life-science entrepreneurs, case studies of recent companies, and hands-on work developing entrepreneurial endeavors will all be utilized. (SP) Lasky

290K. Opportunity Recognition: Technology and Entrepreneurship in Silicon Valley. (3) Three hours of lecture per week. This course is intended to provide the core skills needed for the identification of opportunities that can lead to successful, entrepreneurial high technology ventures, regardless of the individual's “entrepreneurial” skill set, whether technical or managerial. We examine in depth the approaches most likely to succeed for entrepreneurial companies as a function of markets and technologies. Emphasis is placed on the strategic planning and execution strategy in a setting of rapid technological change and limited resources. This course is open to both MBA and engineering students (who have already taken the College of Engineering courses), and is particularly suited for those who anticipate founding or operating technology companies. (SP)

290P. Project Management. (2) Two hours of lecture/discussion per week. This course will provide you with a comprehensive view of the elements of modern project management, guided by real-world, case-related tools. In organizations today, successful operations keep the organization alive and successful projects move it towards strategic objectives. A project is a temporary endeavor undertaken to create a unique goal, limited life-span, and limited resources. The fundamental concepts come from the field of operations management, but projects present special types of operations because of their intended focus, limited lives, constraints, and uncertainties. In organizations today, projects are many, diverse, and frequently overlapping. (SP) Staff

290S. Supply Chain Management. (3) Students will receive no credit for 290S after taking Master of Business Administration 248A and Master of Business Administration 248A. Three hours of lecture per week. This course involves the flows of materials and information among all of the firms that make value to a product, from the source of raw materials to end customers. Elements of supply chain management have been studied and practiced for some time in marketing, logistics, and operations management. We will attempt to integrate these different perspectives to develop a broad understanding of how to manage a supply change. This course will focus on effective supply chain strategies for companies that operate globally with an emphasis on how to plan and integrate supply chain components into a coordinated system. You will be exposed to concepts and models important in supply chain planning with an emphasis on key trade offs and phenomena. The course will introduce and utilize key tactics such as risk pooling and inventory placement, integrated planning and collaboration, and information sharing. Lectures, Internet simulations, computer exercises, and case discussions introduce various models and methods for supply chain analysis and optimization. (F) Angelus

290W. Wireless Communications. (3) Three hours of lecture/discussion per week. In this course, students will study the role of the wireless industry in today’s economy, and market forces in shaping wireless industry structure, value chain, business and operating models, competitive dynamics, and barriers to entry. Special emphasis will be placed on identifying and understanding the challenges for startups and other new entrants. In the context of this course, wireless communications encompasses voice, data, and video services offered over terrestrial and satellite networks. Given its size and relative impact, well over half of the course will be devoted to cellular markets and technologies. (SP) Moazzami

296MA. Master of Engineering Capstone Project. (2) Three hours of independent or group research or study per week. Prerequisites: Acceptance into the Master of Engineering program. This course is the first of a sequence of two capstone project courses for candidates of the Masters of Engineering degree. Students will engage in professional research and design projects. The capstone project may be individual or group research or study under the supervision of a research adviser. The research and study synthesizes the technical, environmental, economic, and social issues involved in the design and operation of complex engineering devices, systems, and organization. (F) Staff

296MB. Master of Engineering Capstone Project. (3) Four hours of independent or group research or study per week. Prerequisites: 296MA. This course is a second of a sequence of two capstone projects
courses for candidates of the Masters of Engineering degree. Students engage in professionally oriented independent or group research or study under the supervision of a research adviser. The research and study synthesizes the technical, environmental, economic, and social issues involved in the design and operation of complex engineering devices, systems, and organizations. (SP) Staff

298A. Group Studies or Seminars. (1-6) Course may be repeated for credit. Variable. Advanced group studies or seminars in subjects which are interdisciplinary in the various fields of engineering or other sciences associated with engineering problems. Topics which form the basis of seminars will be announced at the beginning of each semester. (F.SP) Staff

298B. Group Studies or Seminars. (1-6) Course may be repeated for credit. Variable. Advanced group studies or seminars in subjects which are interdisciplinary in the various fields of engineering or other sciences associated with engineering problems. Topics which form the basis of seminars will be announced at the beginning of each semester. (F.SP) Staff

Engineering—Joint Major Programs
(College of Engineering)

Engineering Student Services:
230 Bechtel Engineering Center #1702, (510) 642-7594
coe.berkeley.edu/joint-majors

Overview of Programs

The Joint Major Programs are designed for students who wish to undertake study in two areas of engineering in order to qualify for employment in either field or for positions in which competence in two fields is required. These curricula include the core courses in each of the major fields. While they require slightly increased course loads, they can be completed in four or five years. Both majors are shown on the student’s transcript of record.

Admission directly to a joint major is closed to freshmen but open to junior transfer students. Students admitted as freshmen may apply to change to a joint major during specific times in their academic progress. Visit the program website at coe.berkeley.edu/joint-majors for complete details.

The Joint Major Programs currently offered are listed below:

Bioengineering/Materials Science and Engineering; Electrical Engineering and Computer Sciences; Materials Science and Engineering; Electrical Engineering and Computer Sciences/Nuclear Engineering; Materials Science and Engineering/Mechanical Engineering; Materials Science and Engineering/Nuclear Engineering

In addition to the Joint Major Programs within the College of Engineering listed above, two joint major curricula involving the College of Engineering and the College of Chemistry are offered. These are: (1) Chemical Engineering/Materials Science and Engineering; and (2) Chemical Engineering/Nuclear Engineering.

Details on the chemical engineering joint major programs and curricula can be found in the Announcement of the College of Chemistry. Students interested in one of the chemical engineering joint majors should contact the College of Chemistry for more information.

Engineering—Undeclared
(College of Engineering)

Engineering Student Services:
230 Bechtel Engineering Center #1702, (510) 642-7594
coe.berkeley.edu/engineering-undeclared

Program Overview

The Engineering—Undeclared Program is for students who are interested in pursuing an engineering education but are undecided on a particular major within the college.

Students admitted to the program enjoy the benefit of a team of advisers who works exclusively with undeclared students and faculty from each major. Together, they help students in the program explore their academic interests, understand and complete requirements, and select a major. The common first year engineering curriculum is supplemented with introductory seminars and courses intended to generate enthusiasm for and develop a better understanding of the different engineering fields.

Students admitted into the program must declare a major by the end of their fourth semester, and if in good academic standing may choose from any of the Engineering Majors including: bioengineering, civil engineering, electrical engineering and computer sciences, engineering mathematics and statistics, engineering physics, environmental engineering science, industrial engineering and operations research, materials science and engineering, mechanical engineering, and nuclear engineering. For more information on these majors, see the corresponding sections of this catalog and the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study available at coe.berkeley.edu/college-of-engineering-announcement.

Admission to Engineering—Undeclared

Freshman applicants interested in applying to the Engineering—Undeclared Program should follow the procedures outlined in the Undergraduate Education and College of Engineering sections of this catalog. Junior transfer applicants may not apply to the program and must choose a specific major.

Historically, the Engineering—Undeclared Program admits from the strongest applicants to the College of Engineering; admission to this program is generally more competitive than admission to other engineering majors. Applicants who know which field of engineering they wish to study should apply to that major.

Engineering Science
(College of Engineering)

Program Office: 230 Bechtel Engineering Center #1702, (510) 642-6790
coe.berkeley.edu/engineering-science
Chair: Tarek Zohdi, Ph.D.; zohdi@me.berkeley.edu

Programs for the Bachelor’s Degree

The undergraduate Engineering Science Program is multidisciplinary and interdisciplinary. The majors consist of closely related fields of the natural sciences, mathematics, physics, and engineering. The majors offered within the Engineering Science Program prepare students especially for advanced graduate study in engineering or the natural sciences. The four engineering science majors include computational engineering science, engineering mathematics and statistics, engineering physics, and environmental engineering science. Note: A proposal has been submitted to discontinue the computational engineering science major. A decision is expected by July 1, 2011.

Applicants may apply to any of the engineering science majors. Students will be advanced to the upper division in engineering science upon satisfactory completion of the lower division requirements.

For more information, see the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study at coe.berkeley.edu/college-of-engineering-announcement.

General Curriculum Requirements for the Bachelor’s Degree

Students must complete a minimum of 120 units, in which they must satisfy the University of California and Berkeley campus requirements outlined in this catalog. In addition, students must complete the requirements for the College of Engineering and one of the engineering science majors. Full details on these requirements can be found in the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study available online at coe.berkeley.edu/college-of-engineering-announcement.

English
(College of Letters and Science)

Undergraduate Office: 322 Wheeler Hall, (510) 642-3467
Department Office: 319 Wheeler Hall, (510) 642-4005
english.berkeley.edu

Professors
†Elizabeth F. Abel, Ph.D. Princeton University. Modern fiction
Charles F. Alpert, Ph.D. University of North Carolina. 20th-century literature, poetry theory
†Jeffrey L. Abrahams, Ph.D. University of Chicago. Russian literature
Micha A. Bernstein, D. Phil. Oxford University. 19th- and 20th-century poetry, literary theory, comparative literature (English, French, German)
†Michail M. Bratianu, Ph.D. SUNY Buffalo. American literature, postwar British literature
Ian Duncan, Ph.D. Yale University. The novel, British literature of 1750-1900, Scottish literature
Mary Catherine Gallagher, Ph.D. University of California, Berkeley. 19th-century British literature, British novels, Victoria nonfiction prize, British women's literature
Cecil S. Giscombe, M.A. Cornell University. Poetry, essays, cross-genre projects, African American poetry, Canadian literature, travel writing
†Dorothy Hale, Ph.D. University of California, Berkeley. American literature, the novel
Robert Hass, Ph.D. Stanford University. Poetry, poetry theory
Lynd Hejinian, B.A. Harvard University. Poetry writing, modernist and postmodern literature, American literature
Abdul JanMohamed, Ph.D. Brandeis University. Third World literature in English, African American fiction, colonial literature and critical theory
Steven Justice, Ph.D. Princeton University. Late Medieval English and Latin literature
Victoria Kahn, Ph.D. Yale University. 17th-century literature, especially Milton
†Jeffrey Knapp, Ph.D. University of California, Berkeley. English Renaissance

Professors
†Recipient of Distinguished Teaching Award

English / 255
Major Requirements

Foundational Courses. All majors must take English 45A-45B-45C (or upper division paired equivalents, when approved by a major adviser) plus one of the following Shakespeare courses: English 17, 117A, 117B, 117J, or 117S. All these required courses must be taken for a letter grade.

Students may declare the major once they have completed 30 units, satisfied the L&S Reading and Composition requirement, and completed these two major requirements:

- 45A or 45B; and
- one of the following: Shakespeare (see list above), 45A, 45B, or 45C.

Upper Division Courses. Of the 12 courses required for the major, at least seven must be upper division.

Pre-1800 Course. One upper division course in British, American, or Anglophone literature from an historical period before 1800 is required and must be taken for a letter grade. Standard course offerings that meet this requirement include English 104, 105, 110, 111, 112, 114A, 114B, 115A, 115B, 118, 119, 120, 125A, and 130A; this requirement may not be fulfilled by English 120 or any of the Shakespeare courses. (Note: Certain designated sections of English 190 can be used to satisfy the pre-1800 requirement.)

Seminar. One upper division seminar—English 190 (Research Seminar)—is required and must be taken for a letter grade.

Note: With the approval of a major adviser, students may count up to two upper division courses in departments other than English toward the major. The request for course approval should be grounded in a compelling intellectual rationale, one that explains how the student's work for the English major will be enriched through the inclusion of the particular outside course the student wishes to take. There is no pre-approved list of courses. For appropriate courses outside English, consult the listings for comparative literature, ethnic studies, foreign language departments, history, history of art, linguistics, philosophy, rhetoric, women's studies, etc. Students gaining 8 units or more of credit toward the English major from education abroad programs normally will not be permitted to count additional upper division coursework from other UC Berkeley departments.

Additional Notes

Honors Program. H195A-H195B is a two-semester course, graded IP at the end of the first semester. Honors in English cannot be granted without a successful completion of this course. Students who take H195A-H195B may choose to waive their English 190 requirement. H195A is organized as a course in literary criticism working toward the formation of a thesis topic. H195B will include regular meetings with the thesis adviser plus small group meetings with the H195 instructor. During the second semester each student will write an honors thesis of 40-60 pages. Completion of the thesis is required for a passing grade in the course. Students with an overall GPA of 3.51 or higher and a GPA of 3.65 or higher in courses taken at Berkeley in the major are eligible to apply. Those accepted must enroll in H195A for the fall semester of their senior year. There may be more than one section offered per semester. Students interested in the Honors Program should check the department's "Announcement of Classes" in early April for exact information.

Meeting with Major Adviser. English majors should meet with a faculty adviser no later than the beginning of the semester following declaration of major. No further courses may be chosen until after the meeting.

Passed/Not Passed. English majors are permitted to take no more than two of the 12 required courses on a passed/not passed basis. These two
courses may not include any of the specifically required courses, i.e., 45A/45B/45C (or their upper division equivalents). Shakespeare, the pre-1800 course, English 190.

Summer Session. Two 3-unit summer session courses may be counted toward the major, one of which must be taken through the Department of English. One of these courses may be taken at another institution, with approval. Courses taken through the Department of English at Berkeley during summer session do not require major adviser approval. For courses taken elsewhere (or outside the major), students must petition for approval by providing documentation, including a course syllabus and a transcript showing completion of the course.

Education Abroad Programs. Credit toward the major for coursework completed through an education abroad program is determined by a major adviser on a case-by-case basis. Students should submit documentation (e.g., course descriptions, syllabi, completed exams, papers, and other written work) to demonstrate that the education abroad course is comparable in coverage, rigor, and substance to a Berkeley upper division course. Students gaining 8 units of credit or more toward the English major for EAP courses normally will not be allowed to count additional upper division coursework from other Berkeley departments toward the major. Two literature courses in a foreign language will be routinely counted toward the major. Courses taken through the Department of English at Berkeley during summer session do not require major adviser approval. For courses taken elsewhere (or outside the major), students must petition for approval by providing documentation, including a course syllabus and a transcript showing completion of the course.

Graduate Program

Students are admitted to graduate studies only in the fall semester. The GRE General Test and Subject Area Test in Literature are required.

The Ph.D. Program. The Ph.D. program requires successful completion of 10 letter-graded courses, of which at least seven will be in English, to be distributed as follows: English 200, an introductory course in literary scholarship, normally taken in the first semester of graduate study; one course at the graduate level in each of four historical fields: Middle Ages (pre-1500; British); 16th Century through 18th Century (British and/or American); 19th Century (British, American, and/or Anglophone); 20th Century (British, American, and/or Francophone); and a course organized in terms other than chronological coverage of English or American literature (e.g., theory, special problems, minority discourse). At least one of these courses must be a 250 seminar, requiring a substantial piece of writing. In addition, students must take English 302 (The Teaching of Composition and Literature). The foreign language requirement must be met, through coursework or examination, by demonstrating reading and writing proficiency in two, approved language(s). The balance of the Ph.D. program includes passing a two-hour oral examination, a prospectus conference, and writing a dissertation. The normative time for completing the doctoral program is six years. Additional details regarding the Ph.D. program are available on the department website.

Prospective students are urged to undertake substantial coursework in English and American literature, as well as to gain a solid background in foreign languages. Prospective applicants should request additional information about program requirements by contacting the Graduate Office, 319 Wheeler Hall.

The M.A. Degree. The Department of English does not offer a separate M.A. program. Students working toward the Ph.D. may, however, receive an M.A. degree after fulfilling the appropriate requirements.

Courses in Writing

Courses in writing require individual conferences as part of the expected student workload.

Some instructors in courses in the 43 and 143 series may offer their classes on a passed/not passed basis. Students will find information about the grading basis of a specific class in these series in the department’s “Announcement of Classes,” available at pre-enrollment.

Enrollment in most writing classes is limited; consult the department’s “Announcement of Classes” for application procedures for these courses.

Lower Division Courses

R1A-R1B. Reading and Composition. (4-4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing requirement or UC Analytical Writing Placement Exam. R1A or equivalent course is prerequisite to R1B. Formerly 1A. Training in writing expository prose.

A. Instruction in expository writing in conjunction with reading literature. Satisfies the first half of the Reading and Composition requirement.

B. Further instruction in expository writing in conjunction with reading literature. Satisfies the second half of the Reading and Composition requirement.

43A. Introduction to the Writing of Short Fiction. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. A workshop course intended for students who have recently begun to write fiction or who have not previously taken a course in creative writing.

43B. Introduction to the Writing of Verse. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. A workshop course intended for students who have recently begun to write verse or who have not previously taken a course in creative writing.

R50. Freeman and Sophomore Studies. (4) Three hours of lecture per week. Prerequisites: R1A or equivalent. Writing-intensive introduction to the study of literature; fulfills the second half of Reading and Composition requirement. Highly recommended for prospective English majors who have not yet taken R1B.

R118. Further Reading in Poetry, Fiction, and Nonfiction. (4) Three hours of lecture per week. Prerequisites: R1A-R1B or equivalent. Reading and response to poetry, fiction, and nonfiction from the modern period. Offered in alternate years.

143A. Short Fiction. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A seminar in writing short stories.

143B. Verse. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A seminar in poetry.

143C. Long Narrative. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A seminar in the writing of prose fiction as an art.

143T. Poetry Translation Workshop. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A seminar in the translation of poetry.

143N. Prose Nonfiction. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. A seminar in the writing of nonfiction.

143V. Visual Autobiography. (4) Six hours of lecture per week. Prerequisites: Consent of instructor. Students will study and write creative nonfiction in visual autobiography. Also listed as Visual Studies C185A, Undergraduate Interdisciplinary Studies C135, and American Studies C174. This course satisfies the American Cultures requirement.
Courses in Language

In addition to the courses listed below, see also 104, 105, 179, 201A, 201B, and 205A-8 as well as offerings in linguistics, philosophy, anthropology, rhetoric, and other disciplines.

Lower Division Courses

25. English as a Language. (4) Three hours of lecture per week. An introduction to the grammar of English, including phonology (articulation), morphology (word structure), syntax (sentence structure), semantics (linguistic meaning), and pragmatics (contextual meaning), with consideration of different varieties of English in use within the United States and throughout the world, and comparison of English with other languages.

Upper Division Courses

101. The History of the English Language. (4) Three hours of lecture per week. The history of the English language from its Indo-European roots, through its Old, Middle, and Early Modern periods, as preserved in the literary heritage, to its different forms in use throughout the world today.

102. Topics in the English Language. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Topics vary from semester to semester.

Courses in Literature

Students in literature courses are expected to devote an average of nine hours per week to class preparation.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit with different topic. One hour of seminar per week. Must be taken on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

26. Introduction to the Study of Poetry. (4) Three hours of lecture per week. Lectures and discussion on poetry intended to develop the student's ability to understand and evaluate a poem. Designed primarily for students whose major is not English, but majors and prospective majors are welcome.

31AC. Literature of American Cultures. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. An introduction to the ethnic diversity of American literature. The course will take substantial account of the literature of three or more of the following groups: African Americans, Native Americans, Asian Americans, Chicano/Latinos, and European Americans. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" well before the beginning of the semester for details. This course satisfies the American Cultures requirement.

39. Freshman Seminar. (4) Course may be repeated for credit as topic varies. Topics vary from semester to semester. Students should consult the department's "Announcement of Classes" for current offerings well before the start of the semester. (Sections limited to 15 students each.)

45A-45C. Literature in English. (4;4;4) Three hours of lecture/seminar per week. Historical survey of literature in English from Chaucer through the 20th century.

A. Literature in English through Milton.

B. Literature in English from the late-17th through the mid-19th century.

C. Literature in English from the mid-19th through the 20th century.

C77. Introduction to Environmental Studies. (4) Students will not receive credit for C12 after taking Environmental Science, Policy and Management C12.

Will count toward ESPM Social Science core requirement for the Conservation and Resource Studies major. Three hours of lecture and one and one-half hours of discussion per week. This integrative course, taught by a humanities professor and a science professor, surveys current global environmental issues; introduces the basic intellectual tools of environmental science; investigates ways the human relationship to nature has been imagined in literary and philosophical traditions; and examines how tools of scientific and literary analysis, scientific method, and imaginative thinking can clarify what is at stake in environmental issues and ecological citizenship. Also listed as Environ Sci, Policy, and Management C12.

80K. Children's Literature. (4) Three hours of lecture per week. The study of selected works written for children.

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for 10 weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2b to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisite: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in residence halls throughout the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.

95. Other Voices: Multicultural Literary Perspectives. (2) Course may be repeated for credit. One hour of lecture and one hour per discussion per week. Must be taken on a passed/not passed basis. This course will introduce students to the literary study currently being undertaken by English department faculty interested in issues of race and class, gender and ethnicity, and the formations of minority discourse. Each week a scholar or writer will lecture on literary study that reflects cultural and racial concerns. Upper division English majors will lead discussion groups focusing upon the methods advocated in the lecture and on various readings. This course does not satisfy major requirements.

Upper Division Courses

104. Introduction to Old English. (4) Three hours of lecture per week. Basic introduction to the vocabulary, grammar, and syntax of Old English designed to get students started in the language immediately. Typical Old English texts include: riddles, charms, medical recipes, laws, chronicles, elegies, saints' lives, heroic poetry, and monster lore.

105. Anglo-Saxon England. (4) Three hours of lecture/discussion per week. Instruction in the basic elements of the Old English language with analysis of literary and cultural issues relating to the formative period of the English nation. (Undergraduates who pass 105 with a grade of B+ or higher, or with permission of the instructor, are eligible to enroll in 205B, Beowulf.)

C107. The English Bible as Literature. (4) Three hours of lecture per week. Formerly 107. Introduction to the English Bible treated as a literary work. Also listed as Religious Studies C119.

110. Medieval Literature. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Development of literary form and idiom throughout the Christian West from the first to the 15th century.

111. Chaucer. (4) Three hours of lecture per week. Lectures on and discussion of Chaucer's major works.

112. Middle English Literature. (4) Three hours of lecture per week. Lectures on the remarkable body of Middle English poetry, especially works of Chaucer studied in the original language.

114A-114B. English Drama. (4;4) Three hours of lecture per week.

A. English drama to 1603.

B. English drama from 1603 to 1700.

115A-115B. The English Renaissance. (4;4) Three hours of lecture per week.

A. Beginnings of the English Renaissance and literature of the 16th century.

B. Literature of the 17th century.

117A-117B. Shakespeare. (4;4) Three hours of lecture per week. A chronological survey of Shakespeare's career.

117J. Shakespeare. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. Study of selected plays, with practice in various critical approaches, e.g., establishing text, relation to source, changing concepts of comedy and tragedy, influence of theatrical conditions on technique.

117S. Shakespeare. (4) Three hours of lecture per week. Lectures on Shakespeare and reading of his works.

117T. Shakespeare in the Theatre. (4) Three hours of lecture per week. Prerequisites: Offered in conjunction with or as a sequel to 117S or 117A-117B. The interrelation of Elizabethan plays and stage practices, Classroom exercises, written assignments, and a final examination. The course will usually culminate in the performance of a play.

118. Milton. (4) Three hours of lecture per week. Lectures on and discussion of Milton's major works.

119. Literature of the Restoration and Early 18th Century. (4) Three hours of lecture per week. Lectures on and discussion of Dryden, Swift, Pope, and some of their contemporaries.

120. Literature of the Later 18th Century. (4) Three hours of lecture per week. Lectures on and discussion of later 18th-century British literature.

121. Romantic Period. (4) Three hours of lecture per week. Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, and contemporaries.

122. Victorian Period. (4) Three hours of lecture per week. Literature of the Victorian period with emphasis on poetry and nonfiction prose.

125A-125B. The English Novel. (4;4) Three hours of lecture per week.

A. Defoe through Scott.

B. Dickens through Conrad.

125C. The European Novel. (4) Three hours of lecture per week. Lectures on and discussion of major European novels.


125E. The Contemporary Novel. (4) Three hours of lecture per week. Important contemporary novels, some of which may be read in translation.


127. Modern Poetry. (4) Three hours of lecture per week. British and American poetry: 1900 to the present.

130A. American Literature: Before 1800. (4) Three hours of lecture per week. Lectures on and discussion of the major writers of the early American period.

130B. American Literature: 1800-1865. (4) Three hours of lecture per week. Lectures on and discussion of the major texts of the American Renaissance.

130C. American Literature: 1865-1900. (4) Three hours of lecture per week. Lectures on and discussion of American literature from the Civil War through 1900.


133A. African American Literature and Culture Before 1917. Three hours of lecture per week. Major literary and cultural texts in the African American tradition from origins through World War I.

133B. African American Literature and Culture Since 1917. (4) Three hours of lecture per week. Major literary and cultural texts in the African American tradition from the Harlem Renaissance through the 20th century.

133T. Topics in African American Literature and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

134. Contemporary Literature. (4) Three hours of lecture per week. Lectures on and discussion of selected works written since World War II.

135AC. Literature of African Americans. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of the literary tradition of African Americans. The course will take substantial account of the literature of three or more of the following groups: African Americans, Native Americans, Asian Americans, and Latin Americans. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for current offerings well before the start of the semester. Also listed as African Studies C111E.

137A. Chicana/o Literature and Culture to 1910. (4) Three hours of lecture per week. Major literary and cultural texts in the Chicana/o tradition from origins through the Mexican Revolution of 1910.

137T. Topics in Chicana/o Literature and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for current offerings well before the start of the semester. Also listed as American Studies C111E.

138. Studies in World Literature in English. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. An examination of various aspects of the modern literature written in English in Africa, the Caribbean, India, and Southeast Asia. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for current offerings well before the start of the semester.

139. The Cultures of English. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. An examination of various aspects of the modern literature written in English in various regions in which English is one of the spoken languages, the Caribbean, Australia, Africa, India; and the writings of specific groups or distinctive cultures in the English-speaking world, including the United States and the British Isles. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for current offerings well before the start of the semester.

152. Women Writers. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Topics will vary from semester to semester.

160. Methods and Materials of Literary Criticism. (4) Three hours of seminar per week. An introduction to issues in literary criticism with emphasis on application of principles and methods to selected literary texts.

161. Introduction to Literary Theory. (4) Three hours of lecture per week. This class will focus on literary theory.

165. Special Topics. (4) Course may be repeated for credit with different topic. Three hours of seminar per week. Designed primarily for English majors. Study of a special topic related to the diversity of the United States. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

165AC. Special Topics in American Cultures. (4) Course may be repeated for credit with different topic. Three hours of seminar per week. Designed primarily for English majors. Study of a special topic related to the diversity of the United States. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester. This course satisfies the American Cultures requirement.

166. Special Topics. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

166A. Special Topics in American Cultures. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of a special topic related to the diversity of the United States. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester. This course satisfies the American Cultures requirement.

170. Literature and the Arts. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Studies in the relationship of literature in English to the arts.

171. Literature and Sexual Identity. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Sexual identity in literature in relation to themes, literary convention, psychology, and the particular politics and sociological structures of individual cultures. This course may range broadly over Western literature or concentrate on one historical period.

173. The Language and Literature of Films. (4) Course may be repeated for credit with different topic. Three hours of lecture per week plus film viewing. Study in film as a mode of representing reality; cinematic techniques and the “language” of film. Lectures, class discussions, and film viewings.

180H. Short Story. (4) Three hours of lecture per week. Lectures on and discussion of the form of the short story.

180L. Lyric Verse. (4) Three hours of lecture per week. Study of lyric forms and techniques.

180N. The Novel. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of the novel as a literary genre, its formal development and variations, its technical possibilities, its cultural functions. Topics may vary from semester to semester.

180R. The Romance. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of the romance as a literary genre. Topics may vary from semester to semester; focus may be historical or restricted to a particular period (e.g., medieval, modern).

180Z. Science Fiction. (4) Course may be repeated for credit with different topic. Three hours of lecture per week. Study of speculative fiction (or science fiction) as a genre. Topics may vary from semester to semester. Focus may be historical or thematic.

189. Research Seminar. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Research-oriented and designed for upper-division English majors. Intensive examination of critical approaches, literary theory, or a special topic in literature and cultural studies. Topics vary from semester to semester. Students should consult the department’s “Announcement of Classes” for offerings well before the beginning of the semester.

Honor and Tutorial Courses

Lower Division Courses

98. Directed Group Study for Freshmen and Sophomores. (1–4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing. Group study of a field that may not otherwise be offered. Any regular course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Open to sophomores with an average of not less than 3.3. Meetings to be arranged. Reading and regular conference with the instructor in a field that shall not coincide with that of any regular course and shall be specific enough to enable students to write essays based upon their studies.

99. Independent Study. (1–4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Open to sophomores with an overall GPA of 3.51 or higher and a GPA of 3.65 or higher in courses taken at Berkeley in the major. Consent of instructor is required. This is a two-semester course, graded IP at the end of the first semester. During the second semester, each student will write an honors thesis. Completion of the thesis is required for passing grade in the course.

190. Directed Group Study. (1–4) Course may be repeated for credit. Meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Open only to senior English major honors candidates (i.e., students with an overall GPA of 3.51 or higher and a GPA of 3.65 or higher in courses taken at Berkeley in the major). Consent of instructor is required. This is a two-semester course, graded IP at the end of the first semester. During the second semester each student will write an honors thesis. Completion of the thesis is required for passing grade in the course.

Upper Division Courses

H195A-H195B. Honors Courses. (4,4) Three hours of lecture per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to senior English major honors candidates (i.e., students with an overall GPA of 3.51 or higher and a GPA of 3.65 or higher in courses taken at Berkeley in the major). Consent of instructor is required. This is a two-semester course, graded IP at the end of the first semester. During the second semester each student will write an honors thesis. Completion of the thesis is required for passing grade in the course.

 Supervised Independent Study for Advanced Undergraduates. (1–4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Open only to students who have completed 12 units of upper division English with an average grade of not less than B. Enrollment is restricted by University regulations. Group study in a field that shall not coincide with that of any regular course and shall be specific enough to enable students to write essays based upon their studies.

199. Supervised Independent Study for Advanced Undergraduates. (1–4) Course may be repeated for credit. Independent. Must be taken on a passed/not passed basis. Prerequisites: Open only to students who have completed 12 units of upper division English with an average grade of not less than B. Meetings to be arranged. Enrollment is restricted by University regulations. Reading and conference with the
Environmental Design
(College of Environmental Design)

Undergraduate Office: 232 Wurster Hall, (510) 642-0832 ced.berkeley.edu
Dean: Jennifer Wolch, Ph.D.
Associate Dean for Undergraduate Studies:
C. Greig Crysler, Ph.D.

Overview
The College of Environmental Design combines in a single academic unit professional instruction in architecture, city and regional planning, landscape architecture, and environmental planning, along with related undergraduate and advanced graduate instructional programs. In addition, students in these three professions, the college is committed to improving practice, contributing to basic knowledge, and addressing ethical issues in areas related to the built environment and its natural setting. To this end, instruction, service, and research programs in this college aim at educating people to build more efficiently and equitably, more beautifully, and in ways better fitted to the multiplicity of human, social, and ecological needs.

The college consists of three departments: Architecture, City and Regional Planning, and Landscape Architecture and Environmental Planning. Undergraduate degree programs in architecture, landscape architecture, and urban studies offer unusual learning opportunities that combine general education, basic skills, and knowledge in the professional fields, with a broad introduction to the built and natural environments. All three departments offer undergraduate minor programs that are open to students majoring in other fields. No undergraduate major or minor programs are professionally accredited by their respective professions. At the graduate level, each department offers the professionally accredited master’s degree. A unique interdisciplinary program among all three departments offers a master’s degree in urban design. And each department provides advanced graduate work leading to the Ph.D.

Undergraduate Programs
Undergraduates enroll in a four-year curriculum leading to the Bachelor of Arts (A.B.) degree with a major in architecture, landscape architecture, urban studies, or an individual major. These curricula provide a broad educational base and pre-professional competency in environmental design fields. In addition, they serve as undergraduate preparation for graduate education both in the design fields and, with properly selected elective courses, in other fields such as business, law, and engineering. Graduates also work in related fields such as urban development, real estate, and construction.

Accreditation. In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-, three-, or two-year term of accreditation, depending on its degree of conformity with established educational standards.

Berkeley’s four-year undergraduate degree in architecture provides a foundation for continued education in a professional master’s degree program or for employment opportunities in architecturally related areas. The four-year professional undergraduate degree, along with a professional graduate degree, comprises an accredited professional
The four-year, preprofessional undergraduate degree in landscape architecture is not accredited by the Landscape Architecture Accreditation Board (LAAB). The preprofessional degree is useful for those wishing a foundation in the field of landscape architecture, as preparation for either continued education in a professional degree program or employment options in entry-level professional practice.

The four-year undergraduate degree in urban studies is not accredited by the Planning Accreditation Board (PAB). Students who complete the major may pursue graduate studies in planning and related disciplines or employment with public agencies, nonprofit organizations, and private firms and service providers.

Admission. High school preparation for the college should include four years of mathematics, one year of physics, and one year of biology or other natural science. Additional preparation could include freehand drawing or introductory drafting. Transfer applicants who have completed 60 semester units or more have completed the prerequisite coursework described at ced.berkeley.edu/advising/admissions. As transfer admissions become increasingly competitive, the college considers applicants who have completed the most complete academic preparation (the fewest prerequisite courses either lacking or in progress) and the highest level of scholastic achievement (indicated by the applicant’s GPA). Environmental science courses beyond the 136 semester units are not usually permitted; consequently, California community college transfer students may receive up to 70 semester units of transfer credit. Units beyond the 80 semester units are not normally admitted to the undergraduate program.

An undergraduate major in architecture or landscape architecture is not a prerequisite for admission to graduate study in the fields. Likewise, an undergraduate major in urban studies is not a prerequisite for admission to graduate study in architecture and regional planning.

Degree Requirements. The A.B. degree programs in the college require the completion of 128 units. Please see ced.berkeley.edu/advising for more information.

Minor Programs. The College of Environmental Design offers several minors. Minors consist of at least five upper division courses as an optional program of coherent and related objectives: (1) to encourage coherence in coursework taken outside the major, and (2) to give recognition to the work when it is completed. The following minors are currently available. These programs have limited enrollments and are not regarded as advanced degrees for professional practice.

An undergraduate major in architecture or landscape architecture is not a prerequisite for admission to graduate study in the fields. Likewise, an undergraduate major in urban studies is not a prerequisite for admission to graduate study in architecture and regional planning.

For information on the Master of Urban Design degree, see the Urban Design section of this catalog.

Organizational Units

Architecture
Department Office: 232 Wurster Hall, (510) 642-4942
Graduate Office: 370 Wurster Hall, (510) 642-5577
Chair: Tom J. Buresh, M.Arch.

City and Regional Planning
Department Office: 228 Wurster Hall, (510) 642-3256
Graduate Office: 228 Wurster Hall, (510) 643-9440

Landscape Architecture and Environmental Planning
Department Office: 202 Wurster Hall, (510) 642-4022
Graduate Office: 206 Wurster Hall, (510) 642-2538
Chair: G. Mathias Kondolf, Ph.D.

The college faculty has established several courses as a core of lower division work that is prerequisites to upper-division major design courses offered by the departments. In addition, certain upper division courses that embrace the interests of more than one department have similar standing as environmental design courses, rather than departmental offerings. Though these courses are administered by only one department, they are administered by one. For information regarding ENV DES 1, 3B, 10, 11A, 11B, 101A, 101B, 105, 169A, 169B, 170, or 195, contact the Department of Architecture. For information regarding ENV DES 10, contact the Department of City and Regional Planning. For information regarding ENV DES 104, 134, or 135, contact the Department of Landscape Architecture and Environmental Planning. ENV DES 201, 251, 252, and 253 are part of the Master of Urban Design degree. For information about these courses, please contact the Graduate office in the Department of Landscape Architecture and Environmental Planning.

Lower Division Courses

1. People and Environmental Design. (3) Course may be repeated for credit. Three hours of laboratory per week. Environmental design involves the study of built, natural, and virtual environments. Various forms of practice include architecture, planning, urban design, and social and environmental activism. This course is a survey of the relationship between people and environments, designed and non-designed, with an introduction to the literature and professional practice. Open to all undergraduate students in the College of Environmental Design as well as other colleges and majors. (F,SP) de Monchaux, Jewell

R prefix=course satisfies R&H requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course

10A. Writing about Environmental Design: Short Compositions. (2-4) Course may be repeated for credit. Three hours of laboratory per week for 10 weeks and one-half hour tutorial every other week. Prerequisites: English 1B and consent of instructor. Formerly 101. An intensive workshop for students interested in writing about architecture, landscape, and our built environment. Recognizing that undergraduate students who take this course represent departments outside as well as within the College of Environmental Design, assignments are touchstones for students of different disciplines or different architectural interests to play into writing about environmental design. Weekly assignments include prose readings, generally essays related to life experience. Brief readings and discussing professional readings, along with weekly writing assignments of 3-5 pages of prose will illustrate the skills involved in the craft of writing. (F) Litchez

10B. Writing about Environmental Design: Longer Compositions. (2-4) Course may be repeated once. Three hours of labor per week and one-half hour tutorial every other week. Prerequisites: English 1B and consent of instructor. Formerly 101. This course may serve as an addition to 10A: Short Compositions. Either required or have elected to write an undergraduate thesis. The
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objective of the course is to assist with this process by defining a topic and constructing a research agenda by which the topic is explored and developed as prose. Students will write the longer composition within a support group which is both critical and encouraging of the individual effort. Topics are individually chosen but refined in concert with the instructor to ensure that the student's objectives can be satisfied within the semester. (SP) Litchez

105. Deep Green Design. (4) Four hours of seminar per week. Prerequisites: Consent of instructor and upper division standing. Students are to have taken at least one design studio and one course on sustainable design. This course addresses problems from an ecological perspective. Design studies of relationships among ecosystem, energy, and resource flows, human social and cultural values, and technological variables as they interact to produce the built environment. (F,SP) Ubbelohde

C169A. American Cultural Landscapes, 1600 to 1900. (3) Three hours of lecture and one hour of discussion per week. Introduces ways of seeing and interpreting American histories and cultures, as revealed in everyday built surroundings—houses, highways, farms, factories, stores, recreation areas, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations, and to speculate for themselves about cultural meaning. Also listed as American Studies C112A and Geography C160A. (F,SP) Groth

C169B. American Cultural Landscapes, 1900 to Present. (3) Three hours of lecture and one hour of discussion per week. Introduces ways of seeing and interpreting American histories and cultures, as revealed in everyday built surroundings—homes, highways, farms, factories, stores, recreation areas, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations, and to speculate for themselves about cultural meaning. Also listed as American Studies C112B and Geography C160B. (SP, Groth)

170. The Social Art of Architecture. (3) Course may be repeated once for credit. Prerequisites: Limited to students who have approved individual majors in the College of Environmental Design. Directed study leading to preparation of a senior thesis. (F,SP) Litchez

195. Senior Thesis. (4) Course may be repeated once for credit. Prerequisites: Limited to students who have approved individual majors in the College of Environmental Design. Directed study leading to preparation of a senior thesis. (F,SP) Litchez

201. Urban Places Advanced Studio. (6) Three hours of lecture and nine hours of studio per week. Prerequisites: Students must be in the Master of Urban Design Program or obtain consent of instructor. The course will focus on the design of urban places program for the Master of Urban Design degree. Faculty resources and issues arising in current urban design practice will be covered. (F, Staff)

252. Urban Place Studies. (3) Three hours of seminar per week. Prerequisites: Students must be in the Master of Urban Design Program or obtain consent of instructor. Seminar focuses on individual urban design interests, the design and research work that students are pursuing in other courses, and development of the thesis or final design projects. (SP) Southworth

298. Environmental Design Group Studies. (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Four to 14 hours of directed group study for four weeks. Must be taken Maryn Smith, Ph.D., Public Health. Prerequisites: Consent of instructor. Topics to be announced at the beginning of each semester. (F,SP)

Environmental Health Sciences

(School of Public Health, Interdepartmental Graduate Groups)

Department Office: 757 University Hall, (510) 643-0289 eshp.berkeley.edu Chair: S. Katherine Hammond

Professors
John Baines, M.D. (Public Health) John Casada, Ph.D. (Environmental Science, Policy, and Management)
Brenda Emery, Ph.D. (Public Health) S. Katharine Hammond, Ph.D. (Public Health)
James Hunt, Ph.D. (Civil and Environmental Engineering) Catherine Koshland, Ph.D. (Public Health)
William Nazaroff, Ph.D. (Civil and Environmental Engineering)
James Robinson, Ph.D. (Public Health) Allen Smith, M.D. (Public Health)
Kirk Smith, Ph.D., M.P.H. (Public Health) Maryn Smith, Ph.D. (Public Health)
Robert Spear, Ph.D. (Public Health) Ira Tager, Ph.D. (Public Health)
Edward Wee (Emeritus), Ph.D.

Associate Professor
Michael Jerrett, Ph.D. (Public Health)

Affiliated Professor
David Rempel, M.D. University of California, San Francisco

Adjunct Faculty
Michael Dubson, Ph.D. (Public Health) Thomas McKone, Ph.D. (Public Health) Stephen Rao, Ph.D. (Public Health)

Associate Adjunct Professors
Luoping Zhang, Ph.D.

Program Overview
Academic degree programs in the Graduate Group in Environmental Health Sciences are recommended for individuals with a clear research orientation who wish to complete work of an interdisciplinary nature. Applicants may apply to the M.S. program, the Ph.D. program, or to the joint M.S./Ph.D. program. (Continuation into the Ph.D. program requires completion of the M.S. requirements). EHS is administered within the Division of Environmental Health and the School of Public Health. Although students receive their academic degrees from the University of California, Berkeley, students are also affiliated with and apply to the School of Public Health. For further information, visit ehs.sph.berkeley.edu.

Environmental Science, Policy, and Management

(College of Natural Resources)

Adjunct Assistant Professors
Brian Fisher, Ph.D. University of California, Davis. Entomology
Robert York, Ph.D. University of California, Berkeley. Forestry
Lecturers
Alan S. Miller (Emeritus), D.Min.
Thomas E. Mitter (Emeritus), Ph.D.

Cooperative Extension Specialists
Kent M. Daane. Biological control of insect pests
Vernard R. Lewis. Biology and management of structural and household pests
Doug McGinnis. Integrated pest management at native California oak
Adina M. Menelenid. Conservation biology
Gary Nakamura. Forestry and silviculture
Thomas Scott. Wildlife conservation, human impacts on wildlife, wildlife/urban interface
Richard B. Standiford. Forestry
William Stewatt. Watershed management, forest management, resource economics
Wendy T. White. Basic research findings on human impacts on wildlife
Rollin A. Van Steenwyk. Pest management of deciduous fruit, nut, and vine crops

Associate Cooperative Extension Specialists
Matteo Garbelotto. Forest pathology, forest mycology, forest and tree management
Christy Getz. Ethics, history, politics, rural development
Maggi Kelly. Graduate
Max A. Moritz. Fire ecology and management

ESPM Overview
The mission of the Department of Environmental Science, Policy, and Management is to bring a diverse research, teaching, and extension capacity to bear on environmental problems from local to global scales. The biological, physical, and social scientists of the department are organized into three divisions on the basis of similar disciplinary or topical research interests, but all work within the unified framework of the analysis of environmental problems and the development of management strategies to address them. Environmental problems demand increased understanding of social, physical, and biological systems as well as the transfer of basic research findings through modeling, implementation, teaching, and extension. ESPM facilitates the cross-disciplinary collaboration necessary to address vital, contemporary questions.

The department includes three divisions: ecosystems, organisms and environment, and society and environment. The faculty have expertise in diverse areas of critical importance to environmental sustainability. Excellence in research and teaching in many disciplines, all brought together to focus on environmental problems, offers students the opportunity to become leaders in research, conservation, restoration, and management of the environment, biodiversity, and natural resources.

Facilities
The Department of Environmental Science, Policy, and Management is spread among Giannini Hall, Mulford Hall, Hilgard Hall, the Valley Life Sciences Building, and Williman Hall. In addition to laboratories and classrooms, the facilities include established and emerging collections; the bioScience and Natural Resource Library has some of the world’s largest collections of books and periodicals on forestry, entomology, and natural resources, and extensive periodical, collection in plant pathology and soils. ESPM also houses specialized laboratories for remote sensing and photogrammetry, tree physiology, pesticide chemistry, plant pathology, natural products chemistry and physiology, and ecology and wildlife biology, as well as well-equipped chemical and microbiological laboratories. There are also extensive herbaria, wildlife specifications, an entomological museum, insectary buildings, growth chambers, bioclimatic chambers, and greenhouses at the nearby Oxford Research Unit and at the Division of Biological Control on the Gill Tract near Albany.

Computer facilities include microcomputer laboratories and terminal rooms. ESPM manages field facilities at the 3,000-acre Blodgett Forest near Georgetown, Whiskeytown Forest adjacent to Sequoia National Park, the Howard Forest near Willits, Russell Reservation near Lafayette, and the Baker Forest adjacent to the department’s Summer Field Camp property. Berkeley’s location also provides easy access to numerous public and private resource management and conservation agencies including the U.S. Forest Service, the U.S. Bureau of Land Management, the U.S. Geological Survey, the California Department of Fish and Game, and the California Department of Fish and Game.

Undergraduate Programs
Courses offered by ESPM are designed to satisfy the College of Natural Resources and across the campus in such diverse but related studies as forestry, conservation and resource studies, botany, biochemistry, geography, and geology.

A number of our courses are of sufficient general interest to attract students who wish to expand their intellectual horizons by learning something about environmental studies. Visit our website for updates at espm.berkeley.edu.

Transfer Applicants
Transfer candidates should complete all lower division requirements for their intended major before entering Berkeley and may be denied admission if they have not done so. The Intersegmental General Education Transfer Curriculum (IGETC) is highly applicable to the lower division requirements major and the society and environment major, and is of limited application to other ESPM programs. In cases where the transfer institution does not have a course equivalent to a specific prerequisite for the major, applicants must take the coursework the first semester of enrollment at Berkeley.

Summer Field Program
In the beautiful mountains of the Plumas National Forest, the UC Summer Field Camp provides students a unique opportunity to study the biota, their environments, and the society and environment. The faculty have expertise in diverse areas of critical importance to environmental sustainability. Excellence in research and teaching in many disciplines, all brought together to focus on environmental problems, offers students the opportunity to become leaders in research, conservation, restoration, and management of the environment, biodiversity, and natural resources.

Facilities
The Department of Environmental Science, Policy, and Management is spread among Giannini Hall, Mulford Hall, Hilgard Hall, the Valley Life Sciences Building, and Williman Hall. In addition to laboratories and classrooms, the facilities include established and emerging collections; the bioScience and Natural Resource Library has some of the world’s largest collections of books and periodicals on forestry, entomology, and natural resources, and extensive periodical, collection in plant pathology and soils. ESPM also houses specialized laboratories for remote sensing and photogrammetry, tree physiology, pesticide chemistry, plant pathology, natural products chemistry and physiology, and ecology and wildlife biology, as well as well-equipped chemical and microbiological laboratories. There are also extensive herbaria, wildlife specifications, an entomological museum, insectary buildings, growth chambers, bioclimatic chambers, and greenhouses at the nearby Oxford Research Unit and at the Division of Biological Control on the Gill Tract near Albany.

Computer facilities include microcomputer laboratories and terminal rooms. ESPM manages field facilities at the 3,000-acre Blodgett Forest near Georgetown, Whiskeytown Forest adjacent to Sequoia National Park, the Howard Forest near Willits, Russell Reservation near Lafayette, and the Baker Forest adjacent to the department’s Summer Field Camp property. Berkeley’s location also provides easy access to numerous public and private resource management and conservation agencies including the U.S. Forest Service, the U.S. Bureau of Land Management, the U.S. Geological Survey, the California Department of Fish and Game, and the California Department of Fish and Game.

Undergraduate Programs
Courses offered by ESPM are designed to satisfy the College of Natural Resources and across the campus in such diverse but related studies as forestry, conservation and resource studies, botany, biochemistry, geography, and geology. A number of our courses are of sufficient general interest to attract students who wish to expand their intellectual horizons by learning something about environmental studies. Visit our website for updates at espm.berkeley.edu.

Transfer Applicants
Transfer candidates should complete all lower division requirements for their intended major before entering Berkeley and may be denied admission if they have not done so. The Intersegmental General Education Transfer Curriculum (IGETC) is highly applicable to the lower division requirements major and the society and environment major, and is of limited application to other ESPM programs. In cases where the transfer institution does not have a course equivalent to a specific prerequisite for the major, applicants must take the coursework the first semester of enrollment at Berkeley.

Summer Field Program
In the beautiful mountains of the Plumas National Forest, the UC Summer Field Camp provides students a unique opportunity to study the biota, their environments, and the society and environment. The faculty have expertise in diverse areas of critical importance to environmental sustainability. Excellence in research and teaching in many disciplines, all brought together to focus on environmental problems, offers students the opportunity to become leaders in research, conservation, restoration, and management of the environment, biodiversity, and natural resources.

Facilities
The Department of Environmental Science, Policy, and Management is spread among Giannini Hall, Mulford Hall, Hilgard Hall, the Valley Life Sciences Building, and Williman Hall. In addition to laboratories and classrooms, the facilities include established and emerging collections; the bioScience and Natural Resource Library has some of the world’s largest collections of books and periodicals on forestry, entomology, and natural resources, and extensive periodical, collection in plant pathology and soils. ESPM also houses specialized laboratories for remote sensing and photogrammetry, tree physiology, pesticide chemistry, plant pathology, natural products chemistry and physiology, and ecology and wildlife biology, as well as well-equipped chemical and microbiological laboratories. There are also extensive herbaria, wildlife specifications, an entomological museum, insectary buildings, growth chambers, bioclimatic chambers, and greenhouses at the nearby Oxford Research Unit and at the Division of Biological Control on the Gill Tract near Albany.

Computer facilities include microcomputer laboratories and terminal rooms. ESPM manages field facilities at the 3,000-acre Blodgett Forest near Georgetown, Whiskeytown Forest adjacent to Sequoia National Park, the Howard Forest near Willits, Russell Reservation near Lafayette, and the Baker Forest adjacent to the department’s Summer Field Camp property. Berkeley’s location also provides easy access to numerous public and private resource management and conservation agencies including the U.S. Forest Service, the U.S. Bureau of Land Management, the U.S. Geological Survey, the California Department of Fish and Game, and the California Department of Fish and Game.
Major in Conservation and Resource Studies

Chief Adviser: Professor Gordon Frankie

The conservation and resource studies major is an interdisciplinary program designed for those who are interested in environmental issues and areas of interaction among natural resources, pop- ulation, economics, society, institutions, and cultural values. Students draw on the course offerings of the entire campus and appropriate community resources in the development of individual programs of study. The major’s orientation is toward flexibility and an individualized educational approach to understanding the structure and dynamic functions of complex environmental systems within our society and biosphere. It encourages interaction among students, faculty, and community.

Course requirements for the major include one ESPM environmental course, one ESPM social science course, and ESPM 90, 100, and 194. In the freshman and sophomore years, students will be expected to take two courses in reading and composition and one course in calculus or statistics. In addition, students must take one course in general biology with lab, one social science, one course each in physical sciences and the humanities, and two courses preparatory to the individual areas of interest. For transfer students, IGETC will satisfy their lower division requirements except ESPM 90. In the junior and senior years, students will concentrate on their areas of interest. A more detailed statement of major requirements is available on the department website and from the office. Applications for on-campus transfers from other majors are reviewed once each semester. Check with the Undergraduate Services office, 260 Mulford Hall, (510) 642-0542, for deadlines each semester.

Minor Program. A minor in conservation and resource studies is available to any Berkeley student in good academic standing. Requirements are completion of a minimum of five courses related to conservation studies totaling a minimum of 12 units on the Berkeley campus. All courses must be taken for a letter grade and must average a minimum of 2.0 grade points overall. Inter- ested students should obtain the requirements from the department before starting the minor. Students will be awarded the minor following satisfactory completion and certification from the department.

Major in Forestry and Natural Resources

Chief Adviser: Professor Kevin O’Hara

The major in forestry and natural resources (FNR) is the result of a merger of the former majors in forestry and in resource management. Special- izations in natural science and human dimen- sions are offered in the study of the ecology and management of forest, woodland, and grassland ecosystems; wildlife biology, water policy, fire science, ecosystem restoration, environ- mental justice, remote sensing and geographical information systems, and rural sociology are available to upper-division students for graduate school and careers in environmental con- sulting, public agencies, nonprofit conservation organizations, and private companies, and for professional, teaching, and research management. Participation in an eight-week summer field program in the northern Sierra Nevada is required.

Accreditation and Licensing. Established in 1914, forestry at Berkeley was the first forestry degree in California to be accredited by the Society of American Foresters. Completion of the Bachelor of Science degree in forestry provides four years of credit toward meeting the required seven years of formal education or professional experience for licensing as a professional forester in California. Students may obtain an additional year of credit toward licensing by completing the Master of Forestry degree. By careful selection of major and minor emphasis, students will complete the requirements for the Bachelor of Science in forestry degree can meet the U.S. Civil Service and state requirements for the forester position.

Minor Program. A minor in forestry and natural resources is available for students who are inter- ested in learning more about the role of forestry and in resource management. Participation in an eight-week summer field program may be considered to fulfill the requirements. A more detailed statement of major requirements and offerings is available on the department website.

Major in Molecular Environmental Biology

Chief Adviser: Professor Rosemary Gillespie

The molecular environmental biology (MEB) major is designed to expose students to the organiza- tion and function of biological organisms at the molecular, cellular, organismal, and ecological levels. The breadth of this vertically integrated program is valuable in the added perspective it provides for understanding and studying organ- isms function in their environment. Molecular approaches are expected to play an increasing role in environmental problem solving in the near future, and educated citizens and researchers alike will need to have a grasp of basic molecular biological principles in order for these approaches to be effective in problem solving. Consistent with the major’s broad scope, students who complete the Bachelor of Science in molecular, cellular, organismal, and ecological biology will find these minor complementary to their professional career goals.

Major in Society and Environment

Chief Adviser: Professor Dara O’Rourke

Social and environmental problems are deeply intertwined. The society and environment major introduces students to the main approaches and theories for understanding social, environmental, and biological sciences, including communication and problem solving. This major is designed to expose students to the main approaches and understanding environmental problems. At the upper division level, there are three major areas of concentration. Students are expected to all choose to focus in one: U.S. environmental policy and manage- ment, global environmental politics, or justice and sustainability.

Graduate Programs

Graduate Student Services: 133 Mulford Hall, (510) 642-6410, (510) 642-1546

Head Graduate Adviser: Professor Claire Kremen

The degree programs address environmental problems of major social and political impact that are based in the biological and physical sciences. Two general programs for graduate students are designed to produce people qualified to address these hybrid problems: (1) broadly based interdisciplinary education, and (2) disciplinary education in relevant fields sup- plemented with expanded interdisciplinary con- tinuum and problem solving. The ESPM program offers both types of education.

Interest in environmental problems has resulted in a dramatic recent increase in undergraduate and graduate programs dealing with various aspects of the environment. Our program integrates the biological, social, and physical sciences to provide advanced education in basic and applied environmental sciences. With the rapid advances in science, we must foster the capacity to con- duct research into the structure and function of ecosystems at molecular through ecosystem scales and their interlinked human social systems. The goal of the program is to provide both a strong disciplinary education and broadly based experi- ence in cross-disciplinary communication and problem solving. In order to achieve this, the program major will be responsible for designing a program that fulfills the degree requirements and meets the student’s needs. This program structure provides the student with flexibility for interaction within the graduate program, while ensuring at least a minimum level of disciplinary competence and understanding.

Four Fields of Emphasis

Students will be required to demonstrate competence in one of the four fields of emphasis defined below. Specific coursework within each field will be chosen by the guiding committee in conjunction with the student and approved by the graduate adviser. The three fields provide flexibility within a clear program structure.

1. Disciplinary Emphasis. The disciplinary emphasis is the broadest academic area, encompassing the student’s interests. At least one disciplinary emphasis within the department are ecosystem sciences, organisms and environment, and society and environment. A student pursuing a strongly interdisciplinary program may study more than one of these disciplines in depth.

Ecosystem sciences. The Ecosystem Sciences Division increases knowledge of the biological, chemical, and physical processes that determine terrestrial and freshwater ecosystems in order to provide a scientific basis for managing ecosystem services. The adverse stresses that society places on terrestrial ecosystems. Central to this is collaboration between biological and physical scientists, leading to an integrated understanding of ecosys- tem composition, structure, and function, as well as to the extension of basic research findings through modeling, implementation, and educational activities.

Organisms and environment. The mission of the Division of Organisms and Environment is to use fundamental research on insect systems to address critical environmental issues and to solve vital environmental problems. Research interests in this division are wide ranging, from the molecular to whole ecosystems, providing a strong integration of biological and environmental processes and a diversity of intellectual challenges for graduate students. Systematics and biodiversity, behavior and neurobiology, and ecology and biological control are notable strengths in this division are wide ranging, from the molecular to whole ecosystems, providing a strong integration of biological and environmental processes.

the practical processes, methods, and implications of forming, choosing, and applying policy and management regimes in different institutional frameworks and environments. This research is applied to concrete problems in human-ecosystem relations from local to global scales in a wide variety of cultural and historical contexts. Theories and methods are chosen from the full range of science and interpretive analysis to satisfy the standards of both significant scholarship and effective practical contribution for the problem of interest.

2. Area of Specialization. The area of specialization is defined within the context of the disciplinary emphasis. Some examples of these areas are microbial community ecology, ecosystem function, insect population and community ecology, evolution of arthropods, conservation biology, American environmental history and policy, international forest management, biogeochemistry, Mediterranean grassland ecosystems, remote sensing, and forest management.

3. Research Methods. Candidates for the Ph.D. must demonstrate competence in research techniques appropriate for the disciplinary emphasis and area of specialization. Preparation in this field must include experimental design, sampling design, data analysis, and hypothesis testing.

4. Breadth Requirement. Each student’s program must include coursework addressing human and ecosystem processes and the relationship between them. All students must complete the required core courses, ESPM 104, 106C, 101C-101S. In addition, any doctoral students in the natural sciences must complete one additional course in the application of social sciences to environmental problems, and those in the social sciences must complete one additional course in the biological or physical sciences. The level of this course will be determined by the guiding committee, based on the student’s background and experience. This course must be a minimum of 3 lower-division undergraduate units or 3 upper-division under-graduate units, and must be taken for a letter grade unless it is offered on a satisfactory/unsatisfactory basis only.

Required Core Courses

All master’s and doctoral students in ESPM are required to take a core course sequence. The first required course—ESPM 201A, Research Approaches in Environmental Science, Policy, and Management (3 units)—will be taken in the first fall semester by all new master’s and doctoral students. By the end of the first fall semester, students must indicate a primary field of study. This information is required of all doctoral students and must either have been taken before, or be in progress, when the doctoral oral qualifying examination is taken. Master’s students are not required to take 201C, ESPM 201S, Environmental Science, Policy, and Management Colloquium (1 unit), required for all doctoral students and must be taken once before the oral qualifying examination. ESPM 201S may be repeated for credit.

Students are also required to complete a minimum of 6 units in their area of specialization. In addition, students in natural sciences must complete one additional course in the application of social sciences to environmental problems, and students in social sciences must complete one additional course in the biological or physical sciences. The guiding committee and the head graduate student will approve the selection of appropriate courses to meet these course requirements.

Admission to the Graduate Program

Applicants for admission to the graduate program must hold a bachelor’s degree from a university or college with curricula and standards equivalent to those of the University of California. The completed undergraduate program should normally be in a field relevant to the disciplinary emphasis. Applicants without this background may be admitted with the understanding that their coursework must compensate for deficiencies in their preparation. Students applying for admission should consult with faculty or the Graduate Student Services office for advice on what courses may be recommended.

It is critical that all applicants identify on their application faculty whose research and work overlap with their strengths. Without this information, the admission committee will not be able to evaluate your application properly. You may wish to contact faculty during the application process, if desired. Faculty will indicate whether entering graduate students will be determined once all applications have been reviewed and final admission offers have been made. The ESPM admission committee, not individual faculty, makes the final decisions on who will be offered admission to the program. Applications are accepted for the fall semester only.

Research Facilities

Departmental facilities of high quality are available to support graduate student research and education. Facilities include state-of-the-art instrumentation and laboratories, insectary buildings, horticulture fields, glasshouse space, and field plots at the Oxford Tract (on campus). Field facilities available to departmental faculty and students include the 3500 acre Blodgett Forest, Giant Forest, and Sequoia, and an extensive green house complex adjacent to Kings Canyon National Park; Russell Reservation, located 13 miles east of the campus. Students may conduct research with an agricultural orientation at any of several University of California field stations which are located throughout the state.

Supplementing the University library are extensive holdings covering the physical, biological, and sociological dimensions of forestry and wildland resource management. The library also maintains one of the largest collections of books describing the natural environment; their meaning for animals and plants. Discussion of basic ecological processes as a basis for understanding environmental problems and formulating strategies for their solution.

Environmental Issues

C10. Environmental Issues. (4) Students will receive no credit for C10 after taking 10. Three hours of lecture and one and one-half hours of discussion per week. Relationship between human society and the natural environment; case studies of ecosystem maintenance and disruption. Issues of economic development, population, energy, resources, technology, and alternative systems. Also listed as Letters and Science C30V. Welter

C11. Americans and the Global Forest. (4) Students will receive no credit for C11 after taking 11. Three hours of lecture and one hour of discussion per week. This course challenges students to think about how individual and American consumer decisions affect forest ecosystems around the world. A survey
course that highlights the consequences of different ways of thinking about the forest as a global ecosys-


Environmental Sciences
24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-4 to be graded on a passed/not passed basis. Section 5 to be graded on a letter-grade basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman sem-


40. Insects and Human Society. (2) Two hours of lecture per week. An introduction to the diversity and natural history of insects in natural and human environ-


44. Biological Control. (2) Two hours of lecture per week. Regulation of populations of organisms, especially insects, through interactions with parasites, predators, pathogens, and other predators. Discussion of examples from agricultural, forest, and urban environments. (F) Mills

Environmental Policy and Management
50AC. Introduction to Culture and Natural Resource Management. (4) Three hours of lecture and one hour of discussion per week. Formerly 50. An intro-


60. Environmental Policy, Administration, and Law. (4) Three hours of lecture and one hour of discussion per week. Introduction to U.S. environmental policy processes, with an emphasis on the roles of federal, state, and local institutions, importance of property, federal and state roles in decision making, and challenges of envi-


General Broad Spectrum Courses
100. Environmental Problem Solving. (4) Three hours of lecture and one and one-half hours of dis-


266 / Environmental Science, Policy, and Management consultation with a faculty sponsor, present a pro-


Upper Division Courses
102A. Terrestrial Resource Ecology. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: Ecology 2 or 20 and EDV 40 or better; consent of instructor. Provides an understanding of terrestrial ecosystems and the interrelationships between terrestrial organisms and their environment. (F) Romm

102B. Natural Resource Sampling. (2) Two hours of lecture per week. Prerequisites: Statistics 2 or 20. This course is designed to introduce students to the major sampling systems used in natural resources and ecology. It is also designed to introduce students to the major sampling systems used in natural resources and ecology. Field data is collected with various important sampling designs and analyzed. Mean values and confidence intervals are computed from the data collected in this course. This course must be taken in conjunction with lecture course 102B. (F) Biging

102C. Resource Management. (4) Three hours of lecture and three hours of laboratory per week. Prerequis-

102D. Resource and Environmental Policy. (4) Three hours of lecture and discussion per week. Prerequisites: Environmental Economics and Policy 1 or one lower division course in social science, or consent of instructor. This course develops a framework for analyzing public policy, the role of economics and environmental policy formation and execution. It develops an understanding of the role of economics and the role of public policies in solving environmental problems. (F) Staff
106. American Wildlife: Identification and Conservation. (3) Three hours of lecture and three hours of laboratory per week, plus four Saturday field trips. Identification and life histories of wildlife in North America, with emphasis on species with important ecological and recreational value. The conservation of rare and endangered species is highlighted. (F) Barnett

107. Biology and Geomorphology of Tropical Islands. (13) Nine hours of lecture for six weeks; field projects for six weeks; three hours of lecture for three weeks. Natural history and evolutionary biology of island organisms, with a focus on conservation. Marine organisms in the coral reef and lagoon systems will be studied, and the geomorphology of volcanic islands, coral reefs, and reef islands will be discussed. Features of island biogeography will be illustrated with topics linked to subsequent field studies on the island of Moorea (French Polynesia). Also listed as Integrative Biology 158BLF. (F) Staff

108A. Trees: Taxonomy, Growth, and Structures. (3) Two hours of lecture and three hours of laboratory per week. Study of trees and associated woody species, including their taxonomy and distribution, modes of shoot growth and diameter growth, and stem structure. Modes of stem growth and formation will be correlated to their natural habitat and life cycle and to the suitability for timber value. Instruction in oral communication. Oral presentation required. (F) Dodd

108B. Forest Genetics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B or equivalents. Course covers basic mechanisms of genetic transmission, major understanding principles of population genetics and analysis of quantitative traits. It examines methods of measuring and describing quantitative genetic variation in trees. Examples of theoretical and practical aspects of genetics are used to understand patterns of genetic variation in natural populations of forest trees, applications to conservation biology, and their implications for developing strategies for reforestation programs of forest tree improvement. (F) Dodd

109. Range Plants. (3) Two hours of lecture and three hours of laboratory per week. Systematic relationships and identification of range grasses, forbs, and shrubs; their distribution, growth, forage values, and resource requirements. (SP) Bartolome

110. Primate Ecology. (4) Three hours of lecture and one hour of discussion per week. This course examines the comparative ecology of sympatric primate species in forests of Central and South America, Africa, and Southeast Asia. In addition to primate ecology, students will master comparative information on the three main tropical forest regions of the world and examine the selective advantage given to both macaque and leaf-eater species. (F) Milton

111. Ecosystem Ecology. (4) Three hours of lecture and one hour of discussion per week. Fifteen to 20 hours of problem-solving exercises per term. Prerequisites: Biology 1B, Forestry 1C11, Integrative Biology C155. This course will develop principles of ecosystem ecology, emphasizing terrestrial ecosystems, and will consider how these principles apply to ecosystem management. Topics include the ecosystem's role in the cycles of carbon and nutrients. (SP) Baldocchi, Silver

112. Microbial Ecology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A and 1B; Molecular and Cell Biology 102 is recommended. Introduction to the ecology of microorganisms. Topics include the ecosystem and evolution of microbes and their relationship with each other and the environment. The role and function of microbes in several ecosystems is also discussed. (SP) Staff

113. Insect Ecology. (2) Two hours of lecture per week. Prerequisites: Biology 1B or consent of instructor. Ecology of insects; interactions with the physical environment; structure and functioning of insect populations and communities; behavioral ecology of predator-prey interactions; plant-insect interactions; social insects; population biology; applied insect ecology. (SP) Welter

114. Wildlife Ecology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Upper division or graduate standing. Introduction to wildlife ecology and its relationship to management programs. Includes population, community, and ecosystem theory and simple difference and ordinary differential equations. Use of simulation packages on microcomputers (previous experience with computers not required). Also listed as Environmental Economics and Policy C115. (F)

115B. Biology of Aquatic Insects. (2) Two hours of lecture per week. Prerequisites: Introductory course in biological science; upper division or graduate standing. Introduction to fish ecology, with particular emphasis on the identification and ecology of California's inland fishes. The course will expose students to the diversity of fishes found in California, emphasizing the physical (e.g., temperature, flow), biotic (e.g., predation, competition), and human-related (e.g., dams, fisheries regulation) factors that affect fishes. Additional students for teacher-prepared field trip. (F) Resh

115C. Fish Ecology. (3) Two hours of lecture and three hours of laboratory per week; one Saturday field trip. Prerequisites: Introduction course in biological science; upper division or graduate standing. Intro- duction to fish ecology, with particular emphasis on the identification and ecology of California's inland fishes. The course will expose students to the diversity of fishes found in California, emphasizing the physical (e.g., temperature, flow), biotic (e.g., predation, competition), and human-related (e.g., dams, fisheries regulation) factors that affect fishes. Additional students for teacher-prepared field trip. (F) Carlson

116B. Range Ecology, Improvements, and Management. (3) Three hours of lecture per week. Prerequisites: One course in ecology. The ecological basis for range management activities, considered in the context of western range ecosystems. Specific range improvement and range management practices are discussed in the context of ecosystem processes. (SP) Allen-Diaz, Bartolome

116C. Tropical Forest Ecology. (3) Three hours of lecture per week. Introduction to thecourse in ecology and one course in chemistry or consent of instructor. Introduction to the ecology of terrestrial tropical ecosystems, with particular emphasis on neotropical forests. Explores, unique tropical ecosystems, especially nutrient cycles, net productivity, biodiversity, forest structure and dynamics, disturbance ecology, and the natural history of key forest organisms. Basic ecology is integrated with discussion of human disturbances, and the role of traditional and improved uses of forests. (SP) Silver

117. Urban Garden Ecosystems. (4) Three hours of lecture and three hours of laboratory per week. An ecosystem approach to the study of urban gardens with an organic perspective. Topics include fundamentals of horticulture, soil properties and fertility, pest and disease management, and food preservation. Laboratories include methods in garden design, plant propagation, compost technique, soil preparation, irrigation systems, pest management, individual plants, and the principles and practices of conservation biology. Factors that affect the creation, destruction, and distribution of biological diversity at the level of the gene, species, and ecosystem are discussed in the context of management options derived from ecology and evolutionary biology that can recover or prevent the loss of biological diversity are explored. Also listed as Integrative Biology C156. (SP) Beissinger

118. Agricultural Ecology. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Examines in a holistic framework fundamental biological, technical, social-economic, and political processes that govern agricultural activity and stability. Management techniques and farming systems' designs that sustain long-term production are emphasized. One Saturday field trip and one optional field trip to an organic farm. (F) Altieri

119. Chemical Ecology. (2) Two hours of lecture per week. Prerequisites: Introductory courses in organic chemistry and biology or consent of instructor. Plant toxins and their effects on animals, hormonal interactions between plants and animals, feeding preferences, and defense mechanisms, and defense interactions between higher plants, and phytoalexins and phytoxins. (F) Kubo

Soil, Water, Atmosphere

120. Soil Characteristics. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, 3A. Introduction to physical, engineering, chemical, and biological properties of soils; methods of soil description, identification, and classification; nutrient and water uses; the role of soil in supplying water and nutrients to plants; and soil organisms. Soil management for agriculture, forestry, and urban uses will also be discussed. Includes a Saturday field trip. (SP) Amundson

121. Development and Classification of Soils. (3) Three hours of lecture per week. Prerequisites: Earth and Planetary Sciences 100A-100B, and Chemistry 1A, 3A recommended. Development, morphology, and classification of soils as related to geology, environment, and soil organisms. Soil development and soil environments; use of soils in archeological and paleoecological studies; anthropogenic effects on soil ecosystems. Offered even numbered years. (SP) Amundson

122. Field Study of Soil Development. (1) Five hours of laboratory per week. Prerequisites: Consent of instructor. Soil development on a wide range of soils in the San Francisco Bay Area. Field trips to locations in the San Francisco Bay Area. (SP) Amundson

123. Summer Field Course. (6) Four-hour days of lecture and a month of rigorous field study. Prerequisites: Career 121, or consent of instructor. An intensive study of soils of California. Field days consist of detailed description, classification, and mapping of selected soils. Emphasis placed on understanding the relationship of soil development to vegetation, geology, and climate. Discussions of suitability of soils for various land uses included. Final exam consists of report preparation and final exam. (SP) Amundson

126. Environmental Soil Chemistry. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A, 3A, and Math 18A or equivalent. This course introduces the fundamental principles of soil science: controlling retention and release of soluble ions and molecules; reaction mechanisms; and energetics. Applies principles and concepts of soil chemistry to environmental conditions; soils, e.g., acidity/alkalinity, aeration, water potential, and salinity, to predict changes in chemical behavior. (SP) Staff

C128. Environmental Aqueous Geochemistry. (3) Three hours of lecture per week. Prerequisites: Civil Engineering 111 or equivalent. Chemical mechanisms controlling distribution and solubility, and biological availability of environmentally important elements in soils. Principles of soil science and the environmental condition of soils, e.g., acidity/alkalinity, aeration, water potential, and salinity, to predict changes in chemical behavior. (SP) Staff
Viruses will be considered as infectious agents taken).

Introduction to Comparative Virology. (4)

Prerequisites: Chemistry 1A, Math 1A-1B, Physics 7A, or consent of instructor. Formerly 130. Three hours of laboratory per week.

Study of the influence of fire, insects, and vertebrate tissues for pathogens. Offered even-numbered years. (SP) Lane

Entomology

140. General Entomology. (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: Introductory course in a biological science. Biology 1A and 1B or equivalent and 134 or equivalent. Three hours of lecture per week. Prerequisites: Prior knowledge of focus group for project. Tools for identification of organisms to species or higher-level taxonomic groups are critically needed. This course will allow students to learn both the theoretical basis of and practical skills for building traditional dichotomous keys and various types of interactive keys. Emphasis will be on learning to build a web-based interactive key and developing natural language descriptions through students' individual projects. Students can train on the Micropics Digital XLT imaging system and learn to use Lucid and Lucid Phoenix software. Other internet identification tools will also be surveyed and discussed. Each student will produce an online key as a project. (F) Will

142. Insect Behavior. (3) Three hours of lecture per week. Prerequisites: Biology 1A and 1B. Insects display an incredibly rich array of behaviors, including extravagant displays of deception, sociality, and slavery. In some cases, these behaviors are innate, but in other cases individual insects can actively learn and modify their future behaviors based on real-life experiences. In this course we will focus on the development, structure, and function of insect behaviors, using examples from classic and recent publications. We will examine the evolution of insect behavior, how the nervous system controls these behaviors, how these behaviors play a role in the ecology of the organism that express them, and explore various modes of communication that allow insects to judge their environment and respond appropriately. (F) Tsutsui

143. Watershed Hydrology. (3) Three hours of lecture/reading/video per week. This course provides an introduction to the science and practice of hydrology. We take a detailed look at the hydrologic cycle, with a focus on the occurrence, movement, distribution, and storage of water. Topics covered include water budgets, precipitation, evaporation, and groundwater flow, and connections to water quality and biogeochemistry. The focus is on developing both a qualitative understanding of hydrological processes and the ability to acquire and analyze hydrologic data. (SP) Boyer

144. Insect Physiology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: General biology, zoology, or entomology. A survey of the unique physiological mechanisms of insects, including the analysis of physiological systems at the cellular-molecular level. The roles of the nervous and endocrine systems in coordinating physiological processes are emphasized. (SP) Tanouye

145. Arthropod-Borne Zoonotic Diseases: Basic Principles and Field Studies. (3) Three hours of lecture per week. Prerequisites: 146 or consent of instructor. Formerly 246. This course will focus on the ecology and epidemiology of zoonotic disease agents transmitted by arthropods. Basic principles will be discussed, and techniques for conducting field and laboratory studies will be demonstrated. Includes methods for collecting bloodsucking arthropods and trapping selected vertebrates; processing of specimens; and examination of arthropod and vertebrate tissues for pathogens. Offered even-numbered years. (SP) Lane

146. Medical/Veterinary Entomology. (3) Two hours of lecture and one hour of demonstration/discussion per week. Prerequisites: 146. The role of insects and other arthropods in the transmission and causation of diseases in humans and domestic animals, including the geographical areas and types of ecosystems inhabited by various species and the structural/behavioral adaptations associated with parasitism. Examples of vector-borne diseases considered include malaria, yellow fever, plague, Rocky Mountain spotted fever, relapsing fevers. Offered odd-numbered years. (SP) Lane

146L. Medical and Veterinary Entomology Laboratory. (1) Three hours of laboratory per week. Laboratory investigation of the major groups of disease agents to humans and other animals, and study of the structural adaptations associated with free-living and parasitic stages and with blood feeding. Offered odd-numbered years. (SP) Lane

147. Field Entomology. (1) Course may be repeated for a maximum of 4 units which may be taken in the same term. One hour of laboratory/lecture per week with a three-day weekend field trip on selected dates. Prerequisites: 42, 140, or consent of instructor. This course introduces methods and techniques for collection and preparation of specimens and associated biological data, field observation, and recording and interpretation of arthropod behavior, relationships to habitats, and plant-arthropod interactions. (F) (SP) Fisher, Grisswold, Kavanagh, Staff

C148. Pesticide Chemistry and Toxicology. (3) Three hours of lecture per week. Prerequisites: Introductory courses in organic chemistry and biology, or consent of instructor. Chemical composition of pesticides and related compounds, their mode of action, resistance mechanisms, and methods of evaluating their safety and activity. Also listed as Nutritional Science and Toxicology C114. (SP) Casida

C149. Molecular Ecology. (4) Students will receive no credit for C149 if they took Integrative Biology 149 prior to spring 2003. Three hours of lecture and one hour of discussion per week. Prerequisites: Integrative Biology 162 or consent of instructor. Formerly Integrative Biology 149. This course focuses on the use of molecular genetic information in ecology. Applications and techniques covered range from analysis of parentage and relatedness (DNA fingerprinting and multilocus analysis) through population history and community composition (comparative DNA sequencing) to analysis of diet and trophic interactions (biological isotopes). Grades are based on one final exam, problem sheets, and a critique of a recent research paper. Also listed as Integrative Biology C149. Offered alternate years. (SP) Staff

Environmental Policy and Law

150. Special Topics in Environmental Science, Policy, and Management. (2-4) Course may be repeated for credit as topic varies. One hour of lecture per week per unit. Special topics in environmental science, policy, and management. Topics may vary from semester to semester. (SP) Staff

151. Society, Environment, and Culture. (4) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: Upper division standing. Issues, concepts, and processes pertaining to the diverse approaches to understanding the relationship between human society, culture, and the environment. Core ideas in and approaches to science, nature, culture, femininity, indigeneity, and postcolonial analysis of the major anthropo- and sociocultural events. Critical analysis and discussion of fundamental and contemporary issues and texts in the field. (SP) Staff

Natural Resource Sociology and Economics

155. Sociology of Natural Resources. (4) Three hours of lecture and one hour of discussion per week. Sociological perspective on the relationship between societies and wildland resource management; social definition of natural resources, identification of publics, social organization of resource use, public involvement, and social impact analysis. (F) Fortmann

C159. Human Diet. (4) Three hours of lecture and one hour of discussion per week. Since we eat every day, wouldn't it be useful to learn more about human dietary practices? A broad overview of the complex
interrelationship between humans and their foods. Topics include the human dietary niche, biological variation related to diet, diet and disease, domestication of staple crops, food processing techniques and development of regional cuisines, modern diets and their problems, food taboos, human attitudes toward foods, and dietary politics. Also listed as Nutritional Science and Toxicology C159. (SP) Milton

Environmental History, Philosophy, and Ethics

160AC. American Environmental and Cultural History. (4) Three hours of lecture and one and one-half hours of laboratory per week. Formerly History 163. The history and philosophy of the American environment and the ways in which different cultural groups have perceived, used, managed, and conserved it from colonial times to the present. Topics include the American Indians, Euro-American and African Americans. Natural resources development includes gathering-hunting-fishing; farming, mining, ranching, forestry, and urbanization. Changes in attitudes and behaviors toward nature and past and present conservation and environmental movements are also examined. Also listed as History 120AC. This course satisfies the American Cultures requirement. (F) Merchant

161. Environmental Philosophy and Ethics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 100 or consent of instructor. A critical analysis of human environments as physical, social-economic, and technocultural ecosystems with emphasis on ideologies, beliefs, attitudes and behavior. An examination of contemporary environmental literature and the philosophies embodied therein. Offered even-numbered years. (F) Merchant

162. Bioethics and Society. (4) Three hours of lecture and one hour of discussion per week. Exploration of current issues arising from recent advances in the biological sciences: genetic engineering, sociobiology, health care delivery, behavior modification, patient rights, social or private control of research. (SP) Winckoff

163AC. Environmental Justice: Race, Class, Equity, and the Environment. (4) Students will receive no credit for 163AC after taking Sociology 128. Deficiency in Sociology 128 may be removed by taking 163AC. Two hours of lecture and one hour of discussion per week. Overview of the field of environmental justice, analyzing the implications of race, class, labor, and equity on environmental degradation and regulation. Environmental justice and its applications to studies of poor and people of color communities in the United States, including African Americans, Latinos, and Native American Indians. Frameworks and methods for analyzing race, class, and labor. Cases of environmental justice from community and policy perspectives. Focus on the role of the environment in understanding human interaction within forested environments, and the future strategies for achieving environmental and labor justice. Also listed as Sociology 137AC. This course satisfies the American Cultures requirement. (F,SP)

Rural and International Development

165. International Rural Development Policy. (4) Three hours of lecture and one hour of discussion per week. Comparative analysis of policy systems governing natural resource development in the rural Third World. Emphasis on organization and function of agricultural and mineral development, with particular consideration of rural hunger, resource availability, technology, and patterns of international aid. (SP) Carr

166. Natural Resource Policy and Indigenous Peoples. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 165 (formerly CRS 163) or consent of instructor; upper division standing. Critical examination of the historical transformation of indigenous peoples and their environments in North America and the Third World. The origins and specific patterns of socioeconomic problems in these areas, economic and policy development policies and their effects. (SP) Staff

167. Environmental Health and Development. (3) Students will receive no credit for 167 after taking C167. Students may remove a deficiency grade in C167 by taking C167. Three hours of lecture per week. Impact of environmental alterations resulting from development programs and other human activities which affect the health of people developed and less developed parts of the world. Case studies and mitigation measures of diseases associated with water storage utilizations. (F) Staff

C167. Environmental Health and Development. (4) Students will receive no credit for C167 after taking 167. Students must remove a deficiency grade in 167 by taking C167. Three hours of lecture and one hour of discussion per week. The health effects of environmental alterations caused by development programs and other human activities are examined in both developing and developed areas. Case studies will contextualize methodological information and incorporate a global perspective on environmentally mediated diseases in diverse populations. Topics include water management; population change; toxics; energy development; air pollution; climate change; chemical use, etc. Also listed as Public Health C160. (F) Morello-Frosch

168. Political Ecology. (4) Three hours of lecture and one hour of discussion per week. Analysis of environmental problems in an international context with a focus on political and economic processes, resource access, and representations of nature. Discussion of the ways in which film, literature, and the news media affect political ideas and policies. Approaches to policy analysis arising from recent social theory. (SP) Peluso

169. International Environmental Politics. (4) Three hours of lecture and one hour of discussion per week. An examination of the dynamics politics and economics have examined over the last 25 years. Attention is paid to different perspectives in global environmental politics, the actors involved, how well international agreements address the problems they are supposed to solve, and the main types of pressing environmental conflicts, security, and environmental justice issues. Issues covered vary but may include climate change, biodiversity, population, and toxics. (F) O-Newel

Resource Assessment and Evaluation

172. Photogrammetry and Remote Sensing. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Geometry, algebra, and trigonometry. This course introduces the concepts and principles of photogrammetry and remote sensing, specifically aerial photography, as important data sources for environmental and natural resource management in spatial sciences such as ecology, geography, geology, civil engineering, and environmental design. Photo measures of scale, area, and object height, flight planning, an introduction to the science and practice of digital remote sensing, and digital data management provide the context of curriculum development. Students will be prepared to interpret and manipulate equations supported by computer simulations. Examples include population, ecosystem, behavioral, and evolutionary ecology. (SP) de Valpine

178A. Teaching and Learning Environmental Science. (3) Three hours of lecture, one hour of discussion, and three hours of field laboratory per week. Prerequisites: Consent of instructor. Introduces theories of cognitive development and the practices of curriculum design and lesson presentation for environmental education. Resource management provide the context of curriculum development. Students create lesson plans integrating core concepts and their knowledge of local environmental issues. Field trips are presented to Bay Area high school and middle school students in field and classroom settings. (F,SP) Spencer

178B. Environmental Science Education Practicum. (4) Course may be repeated for credit. Three hours of lecture, one hour of discussion, and three hours of fieldwork per week. Prerequisites: Consent of instructor. Framed around the topic of sustainability, the course engages students from different science majors to apply the content knowledge from their discipline to build curriculum pieces for presentation in high school classrooms. Students develop pedagogical content knowledge and relate teaching theory to practice. Additional topics covered include classroom management and assessment, instruction, presentation skills, and readings in science education. (F,SP) Staff

Resource Management

C180. Air Pollution. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B and Physics 8A or equivalent consent of instructor. This course is an introduction to air pollution and the chemistry of pollutants. We will focus on the fundamental natural processes controlling trace gas and aerosol concentrations in the atmosphere, and how anthropogenic activity has affected these processes at the local, regional and global scales. Specific topics include stratospheric ozone depletion, increasing concentrations of green house gasses, smog, and changes in the oxidation capacity of the troposphere. Also listed as Earth and Planetary Science C180 and Civil and Environmental Engineering C106. (F) Goldstein

181A. Wildland Fire Science. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. Formerly 181. Fundamentals of wildland fire including behavior, fire modeling, fire history methods, prescribed fire techniques, fire ecology, fire management, fire in the urban-wildland interface, wildland fire and ecosystem management. Laboratory, field surveys, data interpretation and mapping, digital remote sensing, and data management in geographic information systems will be discussed. (SP) Gong

181B. Environmental Science Education Practicum. (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: Upper division standing in a resource discipline. Course details the fulfillment of human needs through forest operations, coupled with the management required to make operations culturally and environmentally appropriate. The framework for understanding human interactions within forested environments includes the operational mesh of technical, financial, organizational, legal, and ecological factors. The worldwide range of stewardship activities studied, including the scientific, aesthetic, social and economic aspects, regeneration, and protection. (F,SP) Staff

183. Forest Planning and Management. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: ’70, 102B or 171, 102C and 185. Planning and management of forestlands to meet multiple objectives of land owners and the society. Processing and organization of land data and forest ecosystem dynamics for quantitative analysis with GIS. Fundamentals of land-use planning, valuation, multiple goal decision analysis, and forest management scheduling. Quantitative, analytical, and communication skills are emphasized. Oral presentation required. (SP) Staff
Special Topics and Independent Studies

190. Seminar in Environmental Issues. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Upper division standing and consent of instructor. Interdisciplinary study of issues for advanced students. Designed to develop skills in critical analysis of specific issues. Different topics will be available for semester study to meet the needs of students interested in pursuing ecological and environmental issues. May be taken once in each academic year. (SP, FSP) Staff

191. The American Forest: Its Ecology, History, and Representation. (4) Three hours of lecture and one hour of discussion per week. The American forest will be examined in terms of its ecology, history, and representation in paintings, photographs, and literary essays. This examination seeks to understand the American forest in its scientific and economic parameters, as well as the historic, social, and ideological dimensions which have contributed to the evolution of our present attitudes toward the forest. Also listed as Undergrad Interdisciplinary Studies C136, History of Art C169, and American Studies C112F. (SP, FSP) Staff

192. Molecular Approaches to Environmental Problem Solving. (2) Two hours of lecture/discussion per week. Prerequisites: Junior or senior standing in Molecular Environmental Biology major, or consent of instructor. Seminar in which students consider how modern biotechnological approaches, including recombinant DNA techniques, can be used to analyze and solve problems in the area of conservation, habitat and endangered species preservation, agriculture and environmental pollution. Students will also develop and present environmental problems solving using modern molecular methods. (F) Lindow

193A. Environmental Education. (3) Five and one-half hours of lecture/discussion and six hours of fieldwork per week. Theory and practice of translating ecological knowledge, environmental issues, and values into educational forms for all age levels and all facets of society, including schools. Concentrated experience in participatory education. Also listed as Education C193A. Hurst

193B. Environmental Education. (3) Five and one-half hours of lecture/discussion and six hours of fieldwork per week. Theory and practice of translating ecological knowledge, environmental issues, and values into educational forms for all age levels and all facets of society, including schools. Concentrated experience in participatory education. Also listed as Education C193B. Hurst

194. Senior Seminar in Conservation and Resource Studies. (2) Two hours of seminar per week. Prerequisites: Senior standing in CRS major. Seminar in which students synthesize various skills and interests into a holistic perspective. A one-hour oral presentation in the area of interest and a senior thesis synthesizing the area of interest are required. Required final seminar for all CRS majors. (F,SP) Staff

195. Senior Thesis. (3-4) Students who have successfully completed the junior year must be taken only by the junior year. Course initiated in the first semester of the senior year. (F,SP) Staff

196. Honors Research. (4) Course may be repeated for a maximum of 8 units. Individual research or meeting with faculty sponsor(s). Twelve hours of work per week. Prerequisites: Open only to upper division environmental science, policy, and management majors; 3.2 minimum GPA. Eligibility restrictions related to GPA and unit accumulation. Supervised independent honors research specific to aspects of environmental science, policy, and management, followed by a written report to department. Submission of no more than 300 words required for approval. (F,SP) Staff

196A. Internship in ESPM—Field Module. (3-8) Fifteen to 40 hours per week at placement location for 10 weeks. Must be taken on a pass/not pass basis. Prerequisites: Upper division standing; consent of adviser, faculty sponsor, and ESPM department; normally restricted to ESPM majors. Intern placement relevant to student’s academic interests and career objectives. Must be approved early in preceding semester. See “Internship Guidelines,” available in ESPM Student Services Office. (F,SP) Staff

196B. Internship in ESPM—Research/Study Module. (3) Course may be repeated for credit. Five and one-half hours of research per week; variable, 10 to 120 hours of research/analysis for five weeks. Prerequisites: Upper division standing in an ESPM major; consent of adviser, faculty sponsor; completion of 195. A five-week analysis of his/her internship experience, preparation of internship report (under the supervision of the chair of the internship committee), and participation in a weekly seminar required of all returning interns. (F,SP) Staff

197. Field Study in Environmental Science, Policy, and Management. (1-3) Course may be repeated for credit. Three hours of field study per week. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. Campus and departmental restrictions apply. Supervised experience in off-campus organizations relevant to specific aspects of environmental science, policy, and management. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Directed Group Studies for Advanced Undergraduates. (1-3) Course may be repeated for credit. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing; consent of instructor; campus and departmental restrictions apply. Group study of special topics in environmental science, policy, and management. Course covering in depth in regular courses in the department. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing; campus and departmental restrictions apply. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. Supervised independent study and research specific to aspects of environmental science, policy, and management. (F,SP) Staff

Graduate Courses

201A. Research Approaches in Environmental Science, Policy, and Management. (3) Two hours of lecture/discussion and one hour of seminar per week. Prerequisites: Graduate standing in ESPM. Formerly 200B. Research projects and approaches in environmental science, policy, and management. The course is mandatory for all ESPM students. (F) Mills

201C. Environmental Forum. (1) Course may be repeated for credit. Two hours of seminar/discussion per week. Prerequisites: Graduate standing in ESPM. Formerly 201B. A series of presentations by visiting scholars and graduate students. The course is mandatory for all ESPM students. (F) Mills

201D. Environmental Science, Policy, and Management Colloquium. (1) One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in ESPM. Formerly 200C. Presentation and analysis of current topics in environmental science, policy, and management. This course is required for all ESPM graduate students. (F,SP) Staff

201E. Environmental Science, Policy, and Management Colloquium. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in ESPM. Formerly 201D. A series of seminars and discussions on current topics in environmental science, policy, and management. This course is required for all ESPM graduate students. (F,SP) Staff

C204. Research Reviews in Animal Behavior: Behavior Review. (1) Course may be repeated for credit. One hour of seminar per week per unit. Prerequisites: Graduate standing in ESPM. Formerly 200D. A series of presentations by visiting scholars, and graduate students. Core course for the ESPM graduate program. (F,SP) Staff

C205. Quantitative Methods for Ecological and Environmental Modeling. (3) Three hours of lecture per week. Course will review the background necessary for students interested in pursuing ecological and environmental modeling. Topics include linear algebra; difference equation, ordinary differential equation, and partial differential equation models; stochastic processes; parameter estimation; and a number of statistical techniques. This course will be recommended as a prerequisite for advanced modeling courses in Integrative Biology, Energy and Resources Group, and Environmental Science, Policy, and Management. Also listed as Integrative Biology C204 and Psychology C204. (F,SP) Staff

209. Pathogen and Disease Ecology. (1) Course may be repeated for credit. One hour of seminar per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Study and discussion of current topics in pathogen and disease ecology. (F) Almeida
210. Spatial Data Analysis for Natural Resources. (3) Three hours of lecture/discussion per week. Prerequisites: One year of upper division probability and statistics, one course in multivariate analysis, or consent of instructor. An introduction to natural resource spatial data analysis. Topics to be covered include spatial sampling, quadrat analysis, distance methods, spatial autocorrelation, and geostatistics (Kriging). Readings will cover applications in various natural resource fields as well as general theory. (SP) Biging

Environmental Science

C211. Modeling Ecological and Meteorological Phenomena. (3) Students will receive no credit for C211 after taking Integrative Biology C271. Three hours of lecture per week. Prerequisites: Integrative Biology 102 or consent of instructor. Introduction to data analysis in ecology and meteorology; stability analysis; effects of anthropogenic stress on natural systems. Also listed as Energy and Resources Group C202. Harte

214. Race, Science, and Resource Policy. (3) Three hours of lecture/semia-ana per week. This course addresses explanation and strategy in natural resource policy with an emphasis on whether, why, and how: (1) “race” distributes access to and control of environmental resources; (2) “science” creates and arrays perceptions, organization, and control of these resources; and (3) public policy shapes racial disparities in natural resource opportunities. Topics are drawn primarily from issues in metropolitan, agricultural, and public resource systems. (F; Romeff)

C220. Isotope Biogeochemistry. (5) Three hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing. Use of isotopes in present and past terrestrial and aquatic research. Lectures cover topics in the field of isotope distribution on Earth (first 10 weeks). The second part of the course focuses on student presentations of case studies and research proposals. In the laboratory, students prepare samples of sediment and mineral species. Also listed as Earth and Planetary Science C241 and Integrative Biology C227. (SP) Amundson, Dawson, Ingram, Mambell

222. Surface and Colloid Chemistry of Natural Particles. (3) Three hours of lecture per week. Prerequisites: 126 or consent of instructor. Structure and connectivity of natural adsorbent particles in aqueous systems; solute adsorption mechanisms and theoretical models; interparticle forces and colloidal phenomena; applications to biogeochemistry and aquatic biology. Offered even-numbered years. (SP) Sposito

C225. Isotopes. (2) Three hours of seminar for ten weeks. Must be taken on a satisfactory/unsatisfactory basis. This seminar will explore topics that employ the use of stable isotopes. Discussion topics include isotope biogeochemistry, paleolimnology, biogeochemistry, soil science, and atmospheric science. Students will be required to lead at least one discussion of relevant literature in the topic area. Also listed as Integrative Biology C225. (F) Amundson, Dawson, Mambell

228. Advanced Topics in Biometeorology and Micrometeorology. (2) Two hours of lecture per week. Prerequisites: C129 or consent of instructor. Measurements of trace gases and energy between the terrestrial biosphere and atmosphere. Micrometeorological flux measurement methods, including eddy covariance, profile, and eddy accumulation methods; hierarchy of biological models and their use for interpreting flux measurement data; Information and theory on big-leaf, two-layer, and multi-layer models that couple energy, water, and carbon to predict trace gas fluxes are presented. How models in forested ecosystems have advanced from leaf to canopy to landscape scales is discussed. (SP) Baldocchi

233. Geographic Information Systems for Environ- mental Science and Management. (3) Three hours of lecture and four hours of laboratory per week. Prerequisites: Introduction to geographic information systems (GIS). The objectives of the course are to: (1) review the GIS basics (data, analysis, and product generation) with special reference to data used in managing California environments; (2) understand the issues surrounding, and algorithms used in, a particular GIS application; and (3) develop an operational GIS application area. This course is divided into four sections: (1) an intensive GIS fundamentals section covering geospatial data input, manipulation, analysis, and effective communication using common visualizations; (2) spatial data analysis; (3) a seminar that discusses linkages with other GIS science disciplines; (4) a topic based case-study portion; and (4) a project development phase. Topics will need to have management applicability for an agency, not-for-profit, or similar type of group involved in environmental management. There will be lectures and labs throughout the class, although lab time nearer the end of class will be dominated by class projects. Readings will be assigned throughout the class. Discussion held. The final class period will be used as an “illust- rated paper” session, in which final projects are displayed and discussed. (F) Kelly

C234. Green Chemistry: An Interdisciplinary Approach to Sustainability. (3) Three hours of lecture per week. Prerequisites: One year of chemistry, including a semester of organic chemistry. Meeting the challenge of global sustainability will require interdisciplinary approaches to research and education, as well as the integration of this new knowledge into society, policymaking, and business. Green chemis- try is an intellectual framework created to meet these challenges and to develop practical solutions. It encourages the design and production of safer and more sustainable chemicals and products. Also listed as Public Health C234 and Chemistry C234. (SP) Staff

238. Special Topics and Advanced Seminars in Plant Pathology. Course may be repeated for credit.

248. Special Topics and Advanced Seminars in Entomology. Course may be repeated for credit.

248C. Seminar in Parastology. (1) Two hours of seminar per week. This course addresses the development of a medico-entomology/parasitology through individual presenta- tions prepared by students. (SP) Lane

Resource Policy

250. Environmental History. (4) Three hours of lecture/discussion per week. Prerequisites: Upper division course in history or history of science or a social science. A critical survey of classical and recent liter- ature in the field of environmental history, philosophy, and ethics, with special emphasis on the American environment. Topics will include environmental histo- riography, theories of environmental history, and the relationships between environmental history, philos- ophy, ethics, and environmental policy. Offered odd-num- bered years. (F) Merchant

251. International Conservation and Development Policy. (3) Three hours of lecture/discussion per week. Prerequisites: One upper division course in interna- tional development studies, Third World rural economy, ecology, and environment and ways in which these are affected by development policies. Historical dimensions of Third World environmental problems. Changing patterns of industrial production (espe- cially food) and resource use; alternative theories of natural resource and socioeconomic development; linkages between socioeconomy and environment in agrarian development policy; technology and resource control; conflict. (SP) Carr

252. Seminar in Forest and Wildland Resource Policy Analysis. (3) Course may be repeated for credit. Three hours of lecture/seminar per week. The seminar includes an overview of policy analysis for wildland resource issues, (2) applications of analysis in policy formation, and (3) processes of policy for- mation. It proceeds through these phases for a specific policy problem selected each year. (SP) Romm

253. Advanced Readings in Political Ecology. (4) Three hours of seminar per week. Prerequisite: Consent of instructor: significant background in social science. Critique and comparison of literature in politi- cal ecology—an approach to sociological analyses of environmental change focusing on environmental con- flict. Initial sessions address the definition of political ecology, its origins, and the politics and discourses of natural resource management. Literature includes classical and contemporary works examining the combi- nation of social and environmental history, local per- spectives, and political economy to discuss accounts of social and environmental change. (SP) Peluso

C254. Ethnic and Cultural Diversity in Health Status. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Focus on ethnicity and cultural diversity in health behav- ior as a basis for public health programs. Considera- tion of U.S. ethnic minority groups and cultural groups in the Western society and health behavior examined in context of relevant social and anthropo- logical theory (social class, acculturation, political economy). Influence of socio-cultural background on health behavior; personal health behavior. Implications for planning public health programs and policies. Also listed as Public Health C250B. (SP) Morello-Frosch

C255. Seminar in Sociology of Forest and Wild- land Resources. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Focus on individual projects and group discussions concerning social constraints to, and effects of, natural resource planning and management. Application of sociological theories to problems of managing wildland ecosys- tems. Students will examine topics of individual inter- est related to the management of wildlands used. Enrolment limited. Also listed as Geography C250. (SP) Sponsel

256. Science, Technology, and the Politics of Nature. (3) Three hours of seminar per week. This course will introduce the methods and theories of sci- ence and technology studies (STS) in order to explore the relationships among science, technology, law, and the domain of natural and human health. The course will focus some attention on the tension between technocracy and democracy in science policy, and on the role of biotechnology in reshaping the nat- ural domain of the political order. Students will graduate students in the social sciences, law, life sciences, and public policy with theoretical and practical tools for analyzing complex problems at the science, technol- ogy, and society interface. Offered even-numbered years. (SP) Winickoff

258. Race, Science, and Resource Policy. (3) Three hours of lecture per week. Formerly 214. This course addresses exploitation and strategy in natural and human resource policy with the following, why, and how: (1) “race” distributes access to and control of environmental resources; (2) “science” creates and arrays perceptions, organization and control of these resources; and (3) public policies exacerbate racial disparity in natural resource opportunities. Topics are drawn primarily from issues in metropolitan, agricul- tural, and public resource systems. (F) Romm

259. Transnational Environmental Politics and Movements. (3) Three hours of lecture and one hour of discussion per week. Prerequisite: Upper division course in environmental policy or social science. Contem- porary issues in international environmental politics; impacts of globalization on the environment; compar- ative transnational environmental movements. Study of current and historical texts. Case studies drawn from around the world with a focus on methods and research techniques. (F) O’Neill

260. Governance of Global Production. (3) Three hours of seminar per week. This course explores crit- ical issues and theoretical questions in the governance of global production. Current trends in the restrict- ing of industrial production; distributions of environ- mental, labor, and social impacts from this production; strategic/anti-fossil fuel strategies for democratic governance are analyzed, including corporate self-regulation, moni- toring, certification and labeling, fair trade programs, legal strategies, and international agreements and agree- ments. (F) O’Rourke

261. Sustainability and Society. (3) Two hours of lecture per week. Prerequisites: Consent of instructor: significant background in social science. Review and reexamination of the contribution of political ecology to the study of comparative phenomena in the field of environmental change. (SP) F. O’Neill

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†Recipient of Distinguished Teaching Award

*Professor of the Graduate School
that are central to the search for sustainability in contemporary societies and their environmental impacts. Theoretical approaches to investigating how science, technology, and environment intersect, how societies move closer to sustainable technological systems. Redesign of existing technologies and the introduction of new technologies; how adverse impacts can be prevented. Case studies of contemporary developments. (SP) Iles

262. Race, Identity, and the Environment. (3) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Advanced reading on environment and race. Shifting meanings of “race” and the usefulness in understanding human-environment relationships. Foundations of environmental ideas and attitudes towards the natural environment and their connections to contemporary environmental movements. Construction of environmental narratives and images in defining ideas of racial and place identity. How representations of the natural environment are structurally and culturally racialized within environmental institutions and the media. The post-race possibilities. (SP) Finney

263. Indigenous, Feminist, and Postcolonial Approaches to Science, Technology, and Environment. (4) Three hours of seminar per week. This seminar presents material from indigenous studies; feminist approach to science and technology studies (STS), including animal studies; political ecology; and other fields. It engages non-dominant knowledges while interrogating the role of key technoscientific concepts (modernity, universality) in racialization of both humans and nonhumans. This course highlights the role of critical methods in shaping power relations in research, including students’ own research. (SP) TallBear

264. Silviculture Seminar. (1) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 185 or consent of instructor. A seminar covering various aspects of silviculture and related issues. (F) O’Hara

Resource Management

265. Seminar on Fire as an Ecological Factor. (2) Course may be repeated for credit. Two hours of lecture/seminar per week. Effect of fire on ecology of forest and rangeland. (F) Stephens

266. Seminar in Forest Ecology. (2) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. A seminar dealing with selected topics in the ecology of forests. (SP) McBride, Battles

268. Seminar in Range Ecology. (2) Course may be repeated for credit. Three hours of seminars per week. Prerequisites: Consent of instructor. A seminar course dealing with selected topics in ecology of rangelands. (F) Staff

271. Advanced Remote Sensing of Natural Resources. (3) Three hours of lecture/seminar per week. Prerequisites: 172. Statistics 2D, or consent of instructor. Advanced photographic systems. Nonphotographic systems including multispectral scanner, imaging spectrometer, thermal, and RADA R. The use of digital image processing, geographic information systems (GIS), and accuracy assessment. A look into linking remote sensing with GIS and integrated analysis of multisource spatial data. Laboratories and application projects are to be arranged. Offered odd-numbered years. (F) Gong

274. Case Studies in Forest Management. (1-8) Course may be repeated for credit. Minimum of four hours per week per unit. Hours to be arranged. Prerequisites: 117, 172, 183, and 185, or equivalent. Individual cases and advanced management training in planning, analysis, and management of forest resources. (F,SP) Staff

276. Advanced Silviculture. (2) Two hours of lecture per week. Prerequisites: 185 or equivalent. Advanced topics related to the dynamics and management of forest stands such as competition effects, mixed-species interactions, mutualism and stand silviculture, pruning, thinning regimes, management for old growth features, wood quality effects, and others. Field trips may be included. Offered odd-numbered years. (SP) O’Hara

277. Advanced Topics in Conservation Biology. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: Undergraduate courses in ecology, population biology, or conservation biology. A graduate level seminar covering advanced topics in conservation biology, biodiversity, focused on designing protected area networks. We will first lay the groundwork for understanding the fundamental papers in ecology and conservation biology that led to systematic conservation planning. Then, we will study various issues at the current frontiers of the discipline, such as incorporating threats, costs, evolutionary processes, and ecosystem services into reserve network design. The class will encourage student engagement through discussions, peer instruction and peer revision, and essay. (SP) Kremen

278. Range Assessment. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 186 and one semester of statistics. Rangeland vegetation sampling techniques with emphasis on comparing the relative efficiency of different techniques of vegetation measurement. Includes weekly lab exercises on artificial sampling boards and/or in the field. Juniors and seniors are encouraged. Offered odd-numbered years. (SP) Allen-Diaz

279. Seminar on Pastoralism. (3) Two hours of lecture per week. Prerequisites: Consent of instructor. A survey of pastoral animal management and production systems, as they influence and are influenced by the rangeland environment. Review of the evolution of animal management practices; contemporary systems in California, the West, and worldwide; and production systems with both traditional and nontraditional goals. Examination of agroforestry and nomadic and transhumant grazing systems, sheep and cattle production, game ranching, and organic meat production will be included. (SP) Hunsaker

280. Seminar in Range Ecosystem Planning and Policy. (3) Course may be repeated for credit. Three hours of lecture/seminar per week. Prerequisites: Consent of instructor. A seminar course dealing with selected current topics in range ecosystem planning and policy. (F) Bartolome

281. Seminar in Wildlife Biology and Management. (2) Course may be repeated for credit. Two hours of lecture/seminar per week. Prerequisites: 114 and 187. Reading, conference, and discussion. Reports and discussion of recent studies in wildlife biology and management. Open to qualified graduate students from other departments. Offered each semester that the course is offered. (F) Huntsinger

284. Demographic Methods for Population Viability Analysis. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Application of demographic methods to the management of plant and animal populations. Conservation problems faced by small populations of threatened or exploited species will be emphasized. Implications for life-history theory will also be discussed. Demographic analyses include: (1) an under-the standing of life histories, projection matrices, and age-and stage-based approaches; (2) calculation of population growth rate and sensitivity of demographic parameters to perturbation; and (3) advanced methods with modeler, spatial analyses, and population viability analyses will be learned. Offer even-numbered years. (F) Beissinger

285. Special Topics Seminar: Forests and Water. (1) One hour of lecture/reading/discussion per week. Forests are vital for rural and urban populations all over the world. They are critical for providing multiple benefits to society, and play a key role in the supply of fresh water and the regulation of climate. Changes in forested landscapes raise concerns about the volume of water flowing to streams, timing of those flows, and water quality. This seminar explores hydrology in forested watersheds and its relevance to contemporary issues. A first emphasis is on the importance of hydrological processes and the water budget, the feedback of water to forests. A second emphasis is impacts of forest management activities on water yield, water quality, and sustainability of forest resources. (F) Boyer

288. Special Topics in Wood Science and Technology. Course may be repeated for credit. Prerequisites: Consent of instructor.

Special Topics and Independent Studies

290. Special Topics in Environmental Science, Policy, and Management. (1-4) Course may be repeated for credit. One hour per week. Prerequisites: Graduate standing or consent of instructor. Study and critical analysis of topics, research, and texts pertinent to environmental science, policy, and management. Different topics will be available each semester reflecting faculty and student interest. (F,SP) Staff

291. Topics in Fluid Mechanics. (1,2) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Lectures on special topics which will be announced at the beginning of each semester that the course is offered. Topics may include transport and mixing, geophysical fluid dynamics, biofluid dynamics, oceanography, free surface flows, non-Newtonian fluid mechanics, among other possibilities. Also listed as Physics C290I, Mathematics C290C, Chemical Engineering C295SM, Civil Engineering C290A and Bioengineering C290C. (F,SP) Staff

296. Individual Study. (1-7) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with a member of the faculty directed to analysis and synthesis of the literature of a specialized subject area in forestry and resource management. (F,SP) Staff

298. Directed Group Study. (1-6) Course may be repeated for credit. Four hours of laboratory/discussion per week per unit. Sections 1-30 to be graded on a letter-grade basis. Prerequisites: Consent of instructor. Advanced study of research topics which vary each semester. (F,SP) Staff

299. Individual Research. (1-12) Course may be repeated for credit. Four hours of laboratory/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Offered in consultation with a faculty member. (F,SP) Staff

601. Individual Study for Master’s Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for master’s degree. Four hours of laboratory/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. May not be used for residence requirements for the doctoral degree. Four hours of laboratory/discussion per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff

Professional Courses

300. Supervised Teaching in Environmental Science, Policy, and Management. (1-6) Course may be repeated for credit. Offered in consultation with the major field adviser. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and appointment as graduate student instructor. Teaching methods at the university level; course content; problem set review and development; guidance of laboratory experiments; course development and evaluation; supervised practice teaching. (F,SP) Staff
Environmental Sciences / 273

Environmental Sciences

(College of Natural Resources)

Environmental Sciences Major

The environmental sciences major is concerned with interactions between human activities and biological and physical environments on all scales, from local to global. Students select to emphasize one of three disciplinary fields: (1) biological science, (2) physical science, or (3) social science. The differences between these emphases lie mainly in the upper division required courses, but both lower and upper division, are virtually the same for each of the three emphases. Details of course requirements appear below.

Declaring the Major

Students in the College of Natural Resources may enter the environmental sciences major. Students wishing to transfer from another major and/or college should contact the undergraduate adviser for details.

Required Courses for All Three Areas of Emphasis: Biological, Physical, Social Science

Lower Division Major Requirements:

- Environmental Sciences 10;
- Environmental Economics and Policy (EEP) C1 or Economics C3;
- Biology 1A-1B (required for biological science) or Biology 11/11L plus one of the following: ESM 102A, 113, 114, 115B, 116A, 116B; Integrative Biology 153, 154, 155 (option for physical and social science only);
- Chemistry 1A and 3A (for biological and physical science); Chemistry 1A and either 1B or 3A for social science;
- Mathematics 1A-1B (required for physical science, recommended for biological and social science); Mathematics may be substituted for biological and social science;
- Physics 7A-7B (required for physical science), Physics 8A for biological and social science.

Upper Division Major Requirements:

- Energy and Resources 102 or ESM C104/EEP C115;
- Statistics 131A (prerequisite to EnvSci 100; Public Health 141 (offered summer only) or 142A);
- Environmental Sciences 100 (prerequisite to 196A-196B);
- Environmental Sciences 196A/L and 196B/L;
- One of the following: Environmental Sciences 125; EPS 170A/EMS 170AC; EPS 102D, 153, 155, 165, or 168; ESPM 160AC/HISTORY 120AC; ESPM 163AC/Soziology 128AC; EEP C101/ Economics C125; or Geography 130.

In addition, students must take at least one upper division course in the chosen area of emphasis (biological, physical, or social science). Check with your college office for the list of approved courses or visit environmentalsciences.berkeley.edu.

Students are required to have a minimum of 30 upper division units of major coursework. Any remaining units may come from courses on the electives list.

Honsors Program

To be eligible for honors, students must meet the minimum GPA established by the college. See the undergraduate adviser for further details.

Environmental Sciences, Policy, and Management

Upper Division Courses

10. Introduction to Environmental Sciences. (3) Three hours of lecture and one hour of discussion per week and one eight-hour field trip per semester. A survey of biological and physical environmental problems, focusing on geology, air and water quality, water supply, solid waste, introduced and endangered species, preservation of wetland ecosystems. Interaction of technical, social, and political approaches to environmental management.

10L. Field Study in Environmental Sciences. (1) Two hours of fieldwork per week. Prerequisites: 10 (must be taken concurrently). Field and laboratory studies of Strawberry Creek throughout its course from the hills to the Bay are used to exemplify integration of the physical, biological, and social components of science-based approaches to environmental management. (F) Berry, Kondolf

C12. Environmental Science for Sustainable Development. (4) Three hours of lecture and one hour of discussion/laboratory. The scientific basis of sustainability, explored through study of energy, water, food, natural resources, and built environment. Physical/ecological processes and systems, and human impacts from the global scale to local energy/resource use. Energy and water audits of UC Berkeley; opportunities to increase sustainability of processes/practices. Discussion/lab section involves data collection/analysis, Strawberry Creek, atmospheric particulates and integrative sustainability assessment project. Also listed as Landscape Architecture C12. (F) Kondolf, Staff

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter/grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen.

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for 15 weeks. One and one-half hours of seminar per week per unit for 10 weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a letter/grade basis. Sections 3-4 to be graded on a letter/grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

98. Directed Group Study. (1-4) Course may be repeated for credit as topic varies. Group meetings of various lengths. Must be taken on a passed/not passed basis. Group studies of selected topics which vary from semester to semester. Enrollment restrictions apply; see the Introduction to Courses and Curriculum section of this catalog. (F,SP)

Upper Division Courses

100. Introduction to the Methods of Environmental Science. (3) Three hours of lecture, one hour of discussion, and one and one-half hours of fieldwork per week. Prerequisites: Environmental science statistics requirement. Open only to declared environmental science majors. Introduces and demonstrates basic methods used in environmental research by biological, physical, and social scientists. The course is designed to teach skills necessary for majors to conduct independent thesis research in the required courses 196A-196B/196L. Topics include development of research questions, sampling methods, experimental design, statistical analysis, scientific writing and graphics, and introductions to special techniques for characterizing
Environmental conditions and features. This course is the prerequisite to 196A, from which the senior thesis topic is determined. (SP)

125. Environments of the San Francisco Bay Area. (3) Three hours of lecture per week. The weather and climate, plants and animals, geology, landforms, and soils of the Bay Area, with an emphasis on the interaction of these physical elements, their modification by humans, and problems deriving from human use. (SP, F)

196A-196B. Senior Research Seminar in Environmental Sciences. (3,3) Four hours of seminar per week. Prerequisites: Senior standing in the environmental sciences major and 100. Seminar and published research reports giving detailed attention to a specific, current environmental problem in the Bay Area. (F,SP)

196L. Senior Research Laboratory in Environmental Sciences. (1,4) Course may be repeated for credit. Three hours of laboratory per week. Prerequisites: Must be taken concurrently with Environmental Science 196A-196B. Independent laboratory or field research in support of the required senior seminar project. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Regulations set by College of Letters and Science. (SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Independent study. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations listed in this catalog. (F,SP)

Epidemiology
(School of Public Health, Interdepartmental Graduate Groups)

Department Office: 101 Haviland Hall, (510) 643-9912
epi.berkeley.edu

Chair: Arthur Reingold, M.D.

Professors
Barbara Armas, Dr.P.H. (Public Health)
Patricia Bulfield, M.P.H., Ph.D. (Public Health)
Ray Catalano, Ph.D. (Public Health)
John Jack Cepeda, M.D., M.P.H. (Public Health)
Brenda Eskesenazi, M.A., Ph.D. (Public Health)
William Jagust, M.D., Ph.D. (Public Health and the Physical Sciences)
Nicholas Jovanovic, J.D., Ph.D. (Public Health)
Arthur Reingold, M.D. (Public Health)
Lee Riley, Ph.D. (Public Health)
William Satariano, Ph.D., M.P.H., M.D. (Public Health)
Steve Silvern, Ph.D. (Public Health)
Allan Smith, M.D., Ph.D. (Public Health)
Gary Smith, M.D., Ph.D. (Public Health)
Marc van der Laan, Ph.D., Public Health
S. Leonard Syme (Emeritus), Ph.D.
Ira Tager (Public Health Emeritus), M.P.H., M.D.
Warren Winkelstein Jr. (Emeritus), M.P.H., M.D.

Associate Professors
Lisa Barcelos, Ph.D. (Public Health)
Sandra Dudoit, Ph.D. (Public Health)
Lisa Fernald, Ph.D., M.B.A. (Public Health)
Alan Hubbard, Ph.D. (Public Health)
Emily J. Ozer, Ph.D. (Public Health)

Assistant Professors
Jennifer Akers, M.P.H., Ph.D. (Public Health)
Mahasin Mujahid, Ph.D. (Public Health)
Amarni Nunu-Jeter, Ph.D., M.P.H. (Public Health)
Maya L. Nakamura, Ph.D. (Public Health)

Professor-in-Residence
John Balmes, M.D., Ph.D. (Public Health)

Adjunct Professors
Michael Bates, Ph.D. (Public Health)
Ellen Eisen, Sc.D. (Public Health)
Nancy Padlan, Ph.D., M.P.H. (Public Health)

Associate Adjunct Professors
Maria Ekstrand, Dr.P.H., M.P.H. (Public Health)
Lee Ann Kaskutas, Dr.P.H., M.P.H. (Public Health)

Adjunct Assistant Professors
Tomáš Aragon, M.D., Dr.P.H. (Public Health)
Heidi Bauer, M.D., M.S. (Public Health)
Kathleen Bernstein, Ph.D. (Public Health)
Suzan Carmichael, Ph.D. (Public Health)
Anuradha Chakravorty, Ph.D. (Public Health)
Catherine Metayer, M.D., Ph.D. (Public Health)
Alexandra Minnis, Ph.D., M.P.H. (Public Health)
Craig Steinmaus, M.D., M.P.H. (Public Health)
Constance Wang, Ph.D. (Public Health)

Program Overview
The Ph.D. group in epidemiology is interdisciplinary and includes faculty from a number of departments at Berkeley as well as the University of California, San Francisco (UCSF). Students receive either an M.S. or Ph.D. degree from the Graduate Division of the Berkeley campus. The group is within the academic jurisdiction of the Graduate Council and is administratively located in the Division of Epidemiology.

The group brings together faculty with disciplinary knowledge in epidemiology, biostatistics, demography, sociology, anthropology, behavioral science, molecular biology, genetics, vector biology, and other fields relevant to the study of human health and disease at a population level. M.S. and Ph.D. students receive a strong background in epidemiologic and biostatistical methods and theory and, in addition, must choose a third disciplinary area in which to develop competence. Doctoral dissertation research is generally focused on developing new knowledge about the factors that influence the distribution of health or given disease outcomes within human populations.

Ethnic Studies
(College of Letters and Science)

Department Office: 506 Barrows Hall, (510) 643-0796
ethnicstudies.berkeley.edu

Chair: Thomas Biolsi, Ph.D.

Professors
Thomas J. Biolsi, Ph.D. (Native American Studies)
Evelyn N. Glenn, Ph.D. (Asian American Studies)
Elaine H. Kim, Ph.D. (Asian American Studies)
Beatrix Manz, Ph.D. (Chicana Studies)
David Montejano, Ph.D. (Chicana Studies)
Norma Alarcon (Chicana Studies Emenda), Ph.D.
Maria Barerra (Chicana Studies Emenda), Ph.D.
Patricia P. Hiden (Native American Studies Emenda), Ph.D.
Carlos Munoz Jr. (Chicana Studies Emenda), Ph.D.
Jose Saldana (Chicana Studies Emenda), Ph.D.
Sau-Iung Wong (Asian American Studies), Ph.D.

Associate Professors
Catherine C. Choy, Ph.D. (Asian American Studies)
Ramón Grosfoguel, Ph.D. (Chicana Studies)
Lanotheria Hsiau, Ph.D. (Ethnic Studies)
Michael U. Omi, Ph.D. (Public Health)
Laura Perez, Ph.D. (Chicana Studies)
Alex M. Sánchez, Ph.D. (Chicana Studies)
Khathury Ahn, Ph.D. (Public Health)
Margaret B. Nevile (Chicana Studies Emenda), Ph.D.
L. Ling-chi Wang (Asian American Studies Emenda), M.A.

Assistant Professors
Keith Feldman, Ph.D. (Ethnic Studies)
Beth Pirotte, Ph.D. (Native American Studies)

Undergraduate Major Adviser:
Mr. St. Germaine.

The Group Major in Ethnic Studies

The Group Major in Ethnic Studies provides a core curriculum designed to develop a comparative and multidisciplinary understanding of the experiences and communities of African Americans, Asian Americans, Chicanos, and Native Americans.

Students majoring in ethnic studies study the history, culture, politics, and sociology of Third World communities in the United States within the general context of American society and institutions. Thus, they pursue knowledge vital for a critical understanding of contemporary society and for social changes to improve the lives and communities of racial minorities.

Ethnic studies majors also prepare themselves for advanced graduate study in either academic or professional fields.

Major Requirements

Lower Division. Ethnic Studies 100AC and 11AC. Completion of one additional elective course from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native Studies Majors. In order to graduate with an A.B. degree with honors, students must obtain at least a 3.3 GPA for all coursework undertaken in the Department of Ethnic Studies. lower division courses from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native American studies, ethnic studies-related courses from other departments, or an approved EAP course.

Upper Division. Ethnic Studies 101A, 101B, and 190. Completion of three elective courses from Ethnic Studies 100, 103, 122AC, C126, 130, 135, 138, 141, N144, 147, 150, 159AC, C170, C173, 180, or 190; completion of two additional elective courses from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native American studies, ethnic studies-related courses from other departments, or an approved EAP course.

Honor. The Department of Ethnic Studies provides a program leading to the A.B. degree with honors. Students will be recommended for honors if they meet the following requirements: (1) that they complete at least 30 units with an average GPA of at least 3.3 for all work undertaken in the Department of Ethnic Studies. lower division courses from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native American studies, ethnic studies-related courses from other departments, or an approved EAP course.

The Minor

Requirements. Completion of three courses from Ethnic Studies 100, 101A, 101B, 103, 122AC, C126, 130, 135, 138, 141, N144, 147, 150, 159AC, C170, C173, 180, or 190; completion of two additional elective courses from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native American studies, ethnic studies-related courses from other departments, or an approved EAP course.

Lower Division Courses

10A. A History of Race and Ethnicity in Western North America, 1598-1998. Prerequisite: (4) Three hours of lecture and one hour of discussion per week. This course explores the role of “race” and ethnicity in the history of what became the Western United States from the Spanish invasion of the Southwest to contemporary controversies surrounding “race” in California. Rather than providing a continuous historical narrative, or treating each racialized “other” separately, the course works through a series of chronologically organized events in which issues of racial differences played key roles in creating what became a western identity. (F) Staff

10AC. A History of Race and Ethnicity in Western North America, 1598-1998. Prerequisite: (4) Three hours of lecture and one hour of discussion per week. This course explores the role of “race” and ethnicity in the history of what became the Western United States from the Spanish invasion of the Southwest to contemporary controversies surrounding “race” in California. Rather than providing a continuous historical narrative, or treating each racialized “other” separately, the course works through a series of chronologically organized events in which issues of racial differences played key roles in creating what became a western identity. (F) Staff

190. Completion of three elective courses from Ethnic Studies 100, 103, 122AC, C126, 130, 135, 138, 141, N144, 147, 150, 159AC, C170, C173, 180, or 190; completion of two additional elective courses from either African American studies, Asian American studies, Chicano studies, ethnic studies, Native American studies, ethnic studies-related courses from other departments, or an approved EAP course.

197. Senior Honors Seminar for Ethnic Studies Majors. In order to graduate with an A.B. degree with honors, students must obtain at least a 3.3 GPA for all coursework undertaken at the University.
narrative, or treating each racialized "other" separately, the courseswork through a series of chronologically organized events in which issues of racial difference played key roles in creating what became a western identity. This course satisfies the American Cultures requirement. (F,SP) Staff

10B. Theories and Concepts in Comparative Ethnic Studies: An Introduction. (4) Three hours of lecture and one hour of obligatory discussion per week. This experience introduces key theorists in race and de-colonization whose work and ideas have formed the basis of scholarly work in the broad, interdisciplinary field of comparative ethnic studies. It is intended both to offer beginning students a ground in the ideas and methods they will encounter throughout their major and to introduce names, texts, and concepts with which all majors should be familiar. (SP) Staff

11AC. Theories and Concepts in Comparative Ethnic Studies: An Introduction. (4) Three hours of lecture and one hour of discussion per week. Formerly 10B. This explores the work of key theorists of race, ethnicity, and de-colonization whose work and ideas have formed the basis of scholarly work in the broad, interdisciplinary field of comparative ethnic studies. It is intended both to offer beginning students a ground in the ideas and methods they will encounter throughout their major, and to introduce names, texts, and concepts with which all majors should be familiar. This course satisfies the American Cultures requirement. (F,SP) Staff

20AC. Introduction to Ethnic Studies. (4) Three hours of lecture and one hour of discussion per week. Formerly 20. The University, its relationship to corporate structures, legislative bodies, community people, and, specifically, Third World people will be analyzed. The University's values will be critically examined. The course includes study of the bodies programs in this country, their development and struggles will be discussed. This course satisfies the American Cultures requirement. (F) Staff

21AC. A Comparative Survey of Racial and Ethnic Groups in the U.S. (4) Three hours of lecture and one hour of discussion per week. Formerly 21. This survey course will examine the historical experiences of European immigrants, African Americans, and Latinx people in the United States. The course will cover the themes of migration and economic change since the late 19th century. Though the class will focus on the three groups, the course will also address salient features of the experiences of Asian Americans, Latinx people, and recent arrived immigrants in light of the themes of the course. Intragroup differences as such as class and gender will be discussed. This course satisfies the American Cultures requirement. (SP) Staff

24. Freshman Seminar. (1) Course may be repeated for credit up to a maximum of three times. One section per week. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member in a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. 41AC. A Comparative Survey of Protest Movements Since the '60s. (4) Three hours of lecture and one hour of discussion per week. Formerly 41. An introductory, comparative, and interdisciplinary study of Native American, Mexican American, African American, and Asian American social and political struggles from 1960-1990. This course traces the development of protest movements created by people of color in response to racial, class, gender, and political inequality in the context of U.S. politics and history. The course stresses the importance of historical and extranational factors contributing to the rise and fall of social and political movements and concludes with an analysis of the current conjuncture of race, ethnicity, culture, class, gender, and sexual preference in U.S. politics. This course satisfies the American Cultures requirement. (F,SP) Staff

C73AC. Indigenous Peoples in Global Inequality. (4) Three hours of lecture per week. This course examines the history of indigenous, aboriginal, native, and first peoples over the last five centuries. Particular attention is paid to how these groups were brought into relations with an expanding Europe, capitalist development, and modern nation-states. How have these peoples survived, what are the contemporary challenges they face, and what resources and allies have they drawn on in the present? Also listed as Native American Studies C73AC. This course satisfies the American Cultures requirement. (SP) Biol/Anthro Staff

97. Field Study in Communities of Color. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Open to freshmen and sophomores only. Supervised community field study. (F,SP) Staff

98. Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Open to freshmen and sophomores only. Group study of selected topics which are not offered in other courses. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Individual research on a topic which will lead to the writing of a major paper. Regular meetings with the faculty sponsor. Limited to freshmen and sophomores. (F,SP) Staff

Upper Division Courses

100. Comparative Ethnic Literature in America. (4) Three hours of lecture and zero to one hour of discussion per week. Formerly 139. A comparative study of racial minorities and European immigrant groups examines selected historical developments and their influences. Another focus is on contemporary discourses and locations. Also listed as Chicano Studies 130A. (4) (F,SP) Staff

101A. Social Science Methods in Ethnic Studies. (4) Three hours of lecture and zero to one hours of discussion per week. Formerly 135. An introduction to commonly used statistical methods and research design. Emphasis on critical thinking and evaluation of scholarly material. (F,SP) Staff

101B. Humanities Methods in Ethnic Studies. (4) Three hours of lecture and zero to one hours of discussion per week. Formerly 135. A basic introduction to critical and historiographical approaches to doing research on communities of color. The course provides an introduction to basic theoretical approaches to the literary and other cultural productions of ethnic or minority communities. Formerly 195A. This course also involves the study of important writings by Latino/a, Native American, African American, Asian American, mixed race writers and, to a lesser degree, the visual art production of these same communities. The course will focus with particular care on discourses of racialization, gender, and sexuality. (F,SP) Staff

103. Proseminar: Issues in the Fields of Ethnic Studies. Course may be repeated for credit with consent of instructor. Three hours of seminar/discussion per week. Prerequisites: Consent of instructor. Designed primarily to give majors in Asian American studies, Chicano studies, Latin American studies, ethnic studies, and Native American studies elementary grounding in the field of study of race and ethnicity. Emphasis will be placed on writing and discussion. For a precise schedule of offerings, see department catalog during pre-enrollment week each semester. (F,SP) Staff

103A. Racialization and Empire. (4) (F,SP)

103B. Ethnicity and the Narrative. (4) (F,SP)

103C. Racialization and Contemporary Communities. (4) (F,SP)

103D. Immigration, Racialization, and Globalization. (4) (F,SP)

103E. Racialization, Gender, and Popular Culture. (4) (F,SP)

122AC. Ethnicity and Race in Contemporary American Films. (4) Three hours of lecture and zero to one hour of discussion per week. Formerly 122. The depiction of race and ethnic relations in American films from the 1960s to the present. The course covers independent features as well as mainstream Hollywood studio films. This course satisfies the American Cultures requirement. (SP) Staff

126. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture and one hour of discussion per week. Course focuses on the production of sexualities, sexual identification, and gender differentiation across multiple discourses and locations. (F,SP) Staff

C126. Ethnicity, Gender, and Sexuality. (4) Three hours of lecture and one hour of discussion per week. Course focuses on the production of sexualities, sexual identification, and gender differentiation across multiple discourses and locations. Also listed as Lesbian Gay Bisexual Transgender ST C148. (F,SP) Staff

130. The Making of Multicultural America: A Comparative Historical Perspective. (4) Three hours of lecture and zero to one hour of discussion per week. Formerly 130AC. How and why did American society become racially and ethnically diverse? This comparative study of racial minorities and European immigrants and ethnic groups examines selected historical developments, events, and themes from the 17th century to the present. (F,SP) Staff

135. Contemporary U.S. Immigration. (4) Three hours of lecture and zero to one hours of discussion per week. Formerly 135AC. The myth, reality, and future of U.S. immigration. This course discusses issues raised by the recent immigration in a comparative, historical approach. An examination of theories, politics, and policy of U.S. immigration restriction. (F,SP) Choy, Montejano

136. Immigrant Women. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: Upper division standing and consent of instructor. Examines patterns of women's immigration to the United States in specific socio-historical and cultural contexts. Special attention to race, ethnic, and identity issues from woman-centered analysis and methodology. (F,SP) Staff

141. Racial Politics in America. (4) Three hours of lecture and zero to one hours of discussion per week. Prerequisites: Upper division standing with priority to ethnic studies majors. A critical and comparative analysis of contemporary politics and issues affecting Mexican American/Latino, Native American, Asian American, and African American communities in the United States. (F,SP) Staff

144AC. Racism and the U.S. Law: Historical Treatments of Peoples of Color. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Sophomores and above. Formerly 144. Intensive historic legal survey of racism in the United States and critical analysis of the legal system's role in perpetuating racism. (F,SP) Staff

prefix=language course for business majors
prefix=prefixcross-lists course
prefix=prefixhonors course
prefix=prefixsatisfies R&C requirement
prefix=prefixsatisfies American Cultures requirement
prefix=prefixonline course
prefix=professor of the undergraduate school
prefix=recipient of distinguished teaching award
States, exploring the legal antecedents of the country’s contemporary stratified society and emphasizing the role of law as a social policy instrument. Readings and lectures will revisit the prevailing legal currency of racism in the United States through an examination of the country’s formative legal documents and the consequent effects of a myriad of judicial decisions on people of color. This course satisfies the American Cultures requirement.

147. Women of Color in the United States. (4) Three hours of lecture per week. Prerequisites: 20 or the introductory course in any of the ethnic studies programs. Examines the history and contemporary situations of women of South Asian, African American, American, and Native American women. Conceptual focus will draw on lived experiences and theoretical constructs of race, class, and gender. (SP) Staff

150. People of Mised Race Descent. (4) Three hours of lecture and zero to one hours of discussion per week. Formerly 150AC. Deals with phenomenon of people of mixed-race descent, focusing on United States but with reference to other nations for comparative purposes. Includes historical perspective as well as exploring the psychology, sociology, literature, and cinema pertaining to topic. (FSP) Staff

159AC. The Southern Border. (4) Four hours of lecture/per discussion per week. The southern border—from California to Florida—is the longest physical divide between two countries in the world. This course examines the border as a distinctive landscape where North-South relations take on a specific spatial and cultural dimension, and where it has been the testing grounds for such issues as free trade, immigration, and ethnic politics. Also listed as Education 186AC and Geography 159AC. This course satisfies the American Cultures requirement. Ma, Shaiken

C170. Fanon and the Network Society. (4) Three hours of seminar per week. Frantz Fanon is one of the foremost theorists of race and decolonization in the 20th century. Today, we are no longer under the Cold War, racism is taking a new turn, and the technification of society may make us believe that reading Fanon may have historical interest but be irrelevant to deal with issues brought about by globalization and the network society. This seminar combines readings in the humanities and social sciences, along with Fanon’s texts on decolonization, society, and subjectivity, in order to imagine a more just, democratic, and “human” society. Also listed as African American Studies C170. (F) Maldonado-Torres

180. Selected Topics in Comparative Ethnic Studies. (1-4) Course may be repeated for credit as topic varies. One hour to one-and-one-half hours of lecture per week. Two to seven and one-half hours of lecture per week for eight weeks. Two and one-half to two hours of lecture per week for six weeks. Students will examine social dynamics as well as cultural and intellectual productions by or about communities of color nationally and internationally from different methodological perspectives. (FSP) Staff

190. Advanced Seminar In Comparative Ethnic Studies. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. In addition to class meetings, an extra assignment/research component will be added to the course, to increase contact hours with students. Possible components include additional readings, outside-of-class research projects, and any other project which the instructor feels will add to the value of the course. Topics are to be announced at the beginning of each semester. (FSP) Staff

195. Selected Issues in Comparative Ethnic Studies Research. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: 20 or consent of instructor. Doing research on issues in U.S. or Third World communities of color. Students will examine theories of society and do research on topics from different methodological perspectives. Issues will vary from semester to semester. (FSP) Staff

196. Senior Thesis. (4) Independent study. Prerequisites: Consent of instructor. Writing of a thesis under the direction of member(s) of the faculty. (F,SP) Staff

H196A-H196B. Senior Honors Seminar for Ethnic Studies Majors. (3,3) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. Prerequisites: H195; consent of instructor; 3.3 GPA on all University work, and a 3.3 GPA in courses in the major. Research seminar for senior ethnic studies majors in preparation and quickening of writing of a senior honors thesis. For senior ethnic studies majors who have been approved for the Honors Program. (F,SP) Staff

197. Field Study in Communities of Color. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Three hours of fieldwork per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised community field study. (FSP) Staff

198. Supervised Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of selected topics which will vary from semester to semester. (FSP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curriculum section of this catalog. Three hours of work per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Individual research or a topic which leads to the writing of a major paper. Regular meetings with the faculty sponsor. (FSP) Staff

Graduate Adviser: Associate Professor Laura Pérez

The Group

The Ethnic Studies Graduate Group Doctoral program focuses on the historical and sociocultural study of the core groups racialized in U.S. history: African Americans, Asian Americans, Chicanos and Indians, and Native Americans. Traditionally, disciplinary in approach, the program encourages students to adopt a broad range of theories and methods to analyze the construction of these ethnocultural groups in relation to each other, in the Euro-American context, and in a transnational context.

The Ethnic Studies Ph.D. Program is a graduate group program, which means that its courses are taught, and its students advised, by faculty not only from the Department of Ethnic Studies but also from other departments on campus. The core faculty consists of faculty from the Department of Ethnic Studies (composed of Asian American Studies), and the Department of African American Studies. The affiliated faculty is composed of faculty from other departments on campus whose expertise addresses the concerns of comparative ethnic studies and who have expressed a special interest in working with graduate students in ethnic studies. Both core and affiliated faculty may teach courses and sit on the examination and dissertation committees of students in the Ethnic Studies Graduate Group doctoral program.

Students may obtain information regarding the requirements and curriculum from the student affairs officer of the Ethnic Studies Graduate Group.

Graduate Courses

200. Critical Terms and Issues in Comparative Ethnic Studies. (4) Four hours of seminar per week. Formerly 200A. Introduction to the field examining the critical practices and salient terms and issues in the study of contemporary cultural and social formations. The focus is interdisciplinary. (F) Staff

201. History and Narrativity: Contemporary Theories and Methods. (4) Four hours of seminar per week. Formerly 200B. The course examines critical theories and methods in the production of historical narratives, social myths, and ideologies dealing with racialization and ethnicity. Special attention is given to employment strategies, tropes, and allegorical forms in the construction of historical events and narratives. (SP) Staff

202. Cultural Texts: Contemporary Theories and Methods. (4) Three hours of seminar per week. The course examines critical theories and methods in the production of cultural knowledge in the humanities. Special attention is given to transdisciplinary articulation with theories and methods in the social sciences. (F) Staff

203. Social Structures: Contemporary Theories and Methods. (4) Three hours of seminar per week. The course examines critical theories and methods in the production of knowledge relevant to social, political, economic, and institutional structures. Special attention is given to transdisciplinary articulation with theories and methods in the humanities. (F) Staff

230. Series in Transdisciplinary Comparative Theories and Methods. (4) Four hours of seminar per week. Research seminar focuses on critical history and practices across disciplines. (F) Staff

240. Series in Comparative Transnational Theories and Methods. (4) Four hours of seminar per week. Research seminar focuses on critical theories and practices in transnational comparative frameworks. (F,SP)

250. Research Seminar: Selected Issues and Topics. (4) Course may be repeated for credit. Four hours of seminar per week. Prerequisites: 200 or con-
sent of instructor. A seminar course designed to involve ethnic studies students directly in the research process. Emphasis on examination and analysis of primary sources, methodology, and the development of theoretical constructs. A major research paper is required. (F,SP)

296. Directed Dissertation Research. (4-12) Course may be repeated for credit. Individual instruction. Must be taken on a satisfactory/unsatisfactory basis. For qualified students directly working on the doctoral disser- tation. (F,SP)

299. Directed Reading. (2-4) Course may be repeated for credit as topic varies. Individual instruction. Prerequisites: Consent of instructor. A term paper is required. (F,SP) Staff

601. Individual Study for Master’s Students. (4) Course may be repeated once for credit. Individual instruction. Must be taken on a satisfactory/unsatisfactory basis. Individual study, in consultation with group faculty, to prepare students for master’s examinations. (F,SP)

602. Individual Study for Doctoral Students. (2-8) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200A-200B. Individual study, in consultation with group faculty, to prepare students for doctoral oral examinations. A student will be permitted to accumulate a maximum of 16 units in 601 and 602, respectively, toward examination preparation. Units earned in these courses may not be used to meet academic residence or unit requirements for the master’s or doctoral degree. (F,SP)

Professional Courses

C301. Critical Pedagogy: Instructor Training. (4) Two hours of seminar and two hours of practicum per week. The seminar provides a systemic approach to theories and practices of critical pedagogy at the university level. Examine the arts of teaching and learn- ing and current disciplinary and cross-disciplinary issues in African/Diaspora and ethnic studies. Participation two hours per week as practicum in 39, Introduction to the University: African American Perspectives, is mandatory. The course is required for students expecting to serve as graduate student instructors in the department. Also listed as African American Studies C301. (F,SP)

302. Professional Orientation. (2) One and one-half hours of seminar per week. Must be taken on a satisf- isfactory/unsatisfactory basis. This seminar is intended to instruct new graduate students in the behavior of professional academics including research, teaching, and academic ethics. (F) Hilden

303. Professional Writing. (2) One and one-half hours of seminar per week. Must be taken on a satisf- isfactory/unsatisfactory basis. This course trains graduate students in writing for professional purposes, such as preparing conference presentations, articles for publication in journals, applications for funding, prequalifying exam position papers, dissertation prospectuses, dissertation chapters, book prospectuses, job applications, etc. Students bring in drafts of their writing for intensive critique by the instructor and fellow students. (F,SP)

Film and Media

(College of Letters and Science)

Film Studies Program: 7408 Dwinelle Hall, (510) 642-1411, filmstudies.berkeley.edu Chair: Anne Nesbit, Ph.D.

Professors
Anton Kaes, Ph.D. (German)
Mark Sandberg, Ph.D. (Scandinavian)
Kajo Silverman, Ph.D. (Rhetoric)
Linda Williams, Ph.D. (Rhetoric)
Seymour Chatman (Rhetoric Emeritus), Ph.D.
Carol Clover (Slavic Languages and Literatures), Ph.D.

Associate Professors
Gavriel Moses, Ph.D. (Italian)
Anne Nesbit, Ph.D. (Slavic Languages and Literatures)
Mirym Szas, Ph.D. (Comparative Literature)
Jeffrey Skotter, Ph.D.
Kristen Whissell, Ph.D.

Adjunct Professors
Mark Berger, B.A.
Russel Merritt, Ph.D.
Assistant Adjunct Professor
Alexander Cohen, Ph.D.

Lecturers
Ulysse Dubout, License de Pedagogie (French)
Marilyn Fabe, Ph.D.
Mira Koppel, M.F.A.

Department Overview

The Department of Film and Media offers an inter- disciplinary program leading to a B.A. in film, a Ph.D. in the film concentration of the Department of Rhetoric, and a Designated Emphasis in film studies for doctoral students located in other departments. This program engages with all forms of moving-image culture, exploring the most popular media forms of the last century (film and still photography) and the most exciting new medium in the form of the new century (digital media). It teaches students to think historically, theoretically, and analytically about a wide range of images within the broad context of humanistic studies. Production opportunities in digital media are available to stu- dents who have demonstrated excellence in theory, history, and analysis.

Film Major

Berkeley offers an interdisciplinary undergradu- ate program leading to a B.A. in film. The program offers rigorous engagement with the entire culture of moving images, teaching students to think his- torically, theoretically, and analytically about a wide range of cinematic forms. At the same time, it encourages students to look at moving images from the vantage point of other disciplines. To this end, the Department of Film and Media cooperates with a number of other departments and pro- grams on campus. Students earning their B.A. in film may also choose to complement their study of the history and theory of moving images with the hands-on experience provided by production classes.

To declare the film major: Film 25A or 25B must be completed. In addition, the student must be pro- gressing in the chosen languages.

Lower Division:

History of Film. Film 25A: film from its beginnings, covering the silent period and the conversion to sound (to 1930); and Film 25B: the classical period through the New Wave and the emergence of new ethnic and national cinemas (1930-1971).

Film majors have two options for completing their language requirement:

(1) students may complete the third semester of a college-level language course in a single language (e.g., French 3), or (2) students may choose to complete the second semester of a college-level language course in two different languages (e.g., German 2 and Swa- hilli 3). (If a student has taken three or more years of a language in high school, that language can count as one of the two languages. In that case students need only complete the second semester of one additional language.)

Language courses that are strictly conversational are not acceptable. Students may enroll in the courses being used to satisfy the film language requirement on a passed/not passed basis. Stu- dents should be aware that if they are also using the course to satisfy the language competency requirement, it must be taken on a letter-graded basis. Any natural language is acceptable. Stu- dents who are native speakers of a language other than English may demonstrate their language competency by satisfactorily passing a language proficiency exam administered by a language department at Berkeley, or by taking an advanced course in the language (such as an upper division course which is taught in the language). Students are expected to demonstrate both verbal and writ- ten proficiency.

Upper Division (32 units of upper division credit are required):

Film Theory: history of film theory (Film 100); Doc- umentary Film: analysis of the development of the documentary film (Film 128); Avant-Garde Film: a survey of the history and aesthetics of avant- garde film (Film 129).

Plus one of the following:

Genre: focus on a particular genre, e.g., western, horror, noir (Film 108); Auteur: focus on an indi- vidual or several related auteurs, e.g., Griffith, Lang, Fellini (Film 151); National Cinema: focus on the cinema of a particular nation or region (Film 160).

Film Electives. 16 units are required to complete the major requirements of 32 upper division units. Check with the department office for approved courses.

Students may choose to take additional courses from the upper-division film and media offerings, including Film 108 (Genre), 140 (Special Topics), 151 (Auteur), 160 (National Cinema), 180A and 180B (Screenwriting), C185 (Digital Video), 186 (Special Topics in Moving Image Production), C187 (Advanced Digital Video). Approved film elective courses drawn from course offerings in the college approved film courses may also be used. Students should contact the undergraduate adviser to obtain a list of approved courses. The list changes each semester.

Honors Program. To be eligible for admission to the Honors Program in film, a student must have attained senior standing with a GPA of 3.3 or higher on all University work and a 3.5 GPA or higher in courses in the major. The levels of honors are as follows: Honors, High Honors, and High- est Honors. Students in the Honors Program are to take Film H195 for a letter grade to complete a senior honors thesis. Although the production of a film may be part of the preparation of the thesis and the film submitted as a documentation or example, it is expected that the thesis will be a substantial piece of writing on film criticism or film history.

Graduate Program

Graduate study in film leading to the Ph.D. is car- ried out under the film track in rhetoric (see the Rhetoric section of this catalog).

Designated Emphasis in Film Studies

Ph.D. students may add a Designated Emphasis (DE) in film studies to their major fields. The DE provides curricular and research resources for students who want to concentrate on film within their...
R1A. The Craft of Writing—Film Focus. (4) Three hours of lecture/discussion per week, plus individual conferences. Formerly Rhetoric R5A. Rhetorical approach to reading and writing argumentive discourse with a film focus. Close reading of selected texts; written themes developed from class discussion and analysis of rhetorical strategies. Satisfies the first half of the Reading and Composition requirement. (F) Staff

R1B. The Craft of Writing—Film Focus. (4) Three hours of lecture/discussion per week, plus individual conferences. Formerly Rhetoric RSB. Intensive argumentative writing stimulated through selected readings, films, and class discussion. Satisfies the second half of the Reading and Composition requirement. (SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-class setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

25A. The History of Film. (4) Three hours of lecture and three to four hours of laboratory per week. From the beginnings through the conversion to sound. In addition to the development of the silent film, the course will conclude with an examination of the technology of sound and examples of early sound experiments. (F) Staff

25B. The History of Film. (4) Three hours of lecture and three to four hours of laboratory per week. Prerequisites: 25A or equivalent. The sound era through the 1970s, drawing on examples from American, European, Asian, and Third World cinema. Staff

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for 10 weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments all across the campus. Sophomore seminars provide an opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

98. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Must be on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores; enrollment by written permission of instructor; 180A recommended. Three hours of lecture and two to three hours of discussion per week. Staff

100. History of Film Theory. (4) Three hours of lecture and three to four hours of film laboratory per week. Prerequisites: 25A or equivalent. The study, from an historical perspective, of major theorists of film. (F) Staff

105. Senior Seminar. (3) Three hours of seminar and two hours of laboratory per week. Prerequisites: Senior standing; completion of all lower division requirements and two out of three of the upper division requirements; GPA of 3.4 or better in the major. Intensive study of topics in film and moving-image media. (F,SP)

108. Special Topics in Film Genre. (4) Course may be repeated for credit. Three hours of lecture and two to three hours of laboratory per week. Prerequisites: Consent of instructor. Formerly C108. The study of films as cultural artifacts and works of art. The class culminates with the reading of completed short scripts. (F,SP)

128. Documentary. (4) Students will receive no credit for 128 after taking 25A. Three hours of lecture and one to three hours of screening per week. Prerequisites: 25A. A survey of the history, theory, and practice of the documentary film (including video). How do the forms and ethics of the documentary changed since the beginning of cinema? A range of practices and strategies will be covered: cinema verite, direct cinema, narrational documentary, autobiography, investigative documentary, and recent fictional styles that combine the essayistic with the observational. The course moves between classic works of the genre as well as highly experimental works that critique traditional approaches. Throughout, the emphasis will be on selecting and analyzing films through their narrative structures and the ways in which they make meaning. (SP) Staff

129. History of Avant-Garde Film. (4) Three hours of lecture, one hour of discussion, and one to three hours of laboratory per week. Prerequisites: 25A. This course is an introduction for students of the history, theory, and practice of European and international avant-garde cinema from the 1920s to the present. The course explores the development of a range of experimental film forms and situates them in relation to the larger artistic, social, and political contexts in which they appeared. At the same time, the ways artists have not only created new film languages in order to express their unique ideas and vision, but also how they inverted alternative modes of production, distribution, and exhibition. We examine the major formal modes of avant-garde cinema, moving between historical and current developments. These include abstract, surrealist/Dada, expressionism, the lyric film, the reel town, the materialist cinema, and the design of games. One process which is

140. Special Topics in Film. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Declared film major or consent of instructor. Selected topics in the study of film. (F,SP) Staff

151. Auteur Theory. (4) Course may be repeated for credit. Three hours of lecture and two to three hours of laboratory per week. Prerequisites: 25A or consent of instructor. The study of films from the perspective of directorial style, theme, or filmmaking career. (F,SP) Staff

160. National Cinema. (4) Course may be repeated for credit as topic varies. Three hours of lecture and one hour of discussion per week. Prerequisites: Declared film major or consent of instructor. The course will focus on the cinema of a particular nation or region. (F,SP) Staff

180A. Screenwriting. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly 180. The course explores the art and craft of writing a feature-length, narrative screenplay. Participants begin with a detailed outline of a narrative script and a portion of the script in proper form and develop it into a completed screenplay. The focus is on rewriting, with regular presentations of scenes to fellow writers. Participants also write short scripts and explore alternative story structure. The emphasis is on characterization, scene structure, visual story telling, dialogue, and creating a unified script. (F,SP)

180B. Screenwriting. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor; 180A recommended. The course explores the art and craft of writing a feature-length, narrative screenplay. Participants begin with a detailed outline of a narrative script and a portion of the script in proper form and develop it into a completed screenplay. The focus is on rewriting, with regular presentations of scenes to fellow writers. Participants also write short scripts and explore alternative story structure. The emphasis is on characterization, scene structure, visual story telling, dialogue, and creating a unified script. (F,SP)

181. Game Design Methods. (4) Two hours of lecture and two to four hours of laboratory per week. Prerequisites: 25A. This course offers an introduction to game design and game studies. Game studies has five core elements: (1) the study of games as cultural artifacts; (2) the study of play and interactivity; (3) the study of games as symbolic systems; (4) the study of games as artifacts; and (5) the design of games. The process which is at the core of all game elements is to play. We will study the core elements of game studies through play, play tests, and the study of people playing. There will also be a close examination of classical games as well as practice-oriented texts. The final exam for this course is to design, test, and evaluate a playable game. (F,SP)

C181. Game Design Methods. (4) Two hours of lecture and two to four hours of laboratory per week. Prerequisites: 25A, Art 23AC, and Art 172. This course offers an introduction to game design and game studies. Game studies has five core elements: (1) the study of games as cultural artifacts; (2) the study of play and interactivity; (3) the study of games as symbolic systems; (4) the study of games as artifacts; and (5) the design of games. One process which is
185. The Language of Cinema. (4) Nine hours of studio per week. Prerequisites: Declared film major. Completion of lower division requirements with grade of B+ or better; consent of instructor. This course introduces the essential techniques of film and video production—camera, sound, lighting, and editing. Drawing on previous study of narrative forms, students will familiarize themselves with the basics of film and video production. Following a studio period each week, students will gain a deeper understanding of the complex relationship between the visual and aural elements of moving image through hands-on experimentation. (F,SP) Staff

186. Special Topics in Moving-Image Production. (4) Four hours of studio per week. Prerequisites: 185 with a grade of A- or better and consent of instructor. This course investigates special topics in, and special techniques of, moving-image production (e.g., experimental film, animated documentary, digital interactive works, etc.). This is a hands-on studio course designed for students who have mastered the basics of moving-image production and are ready to pursue more specialized film or video production. (F,SP) Staff

187. Advanced Digital Video. (4) Nine hours of studio per week. Prerequisites: 100. 185 with a grade of A- or better and consent of instructor. This advanced studio course is designed for students who have mastered the elements of digital video production and are interested in further investigating critical, theoretical, and creative research topics in digital video production. Also listed as Practice of Art C174. (F,SP) Staff

195. Film Honors Thesis. (4) Independent study with faculty. Prerequisites: Senior standing with a 3.3 GPA on all University work and a 3.5 GPA in courses in the major. Students in the Honors Program are to take H195 for a letter grade to complete a senior honors thesis. The production of a thesis may be part of the preparation of the thesis and the film submitted as a documentation or example, it is expected that the thesis will be a substantial piece of writing of film criticism or film history. (F,SP) Staff

197A. Field Study at the Pacific Film Archive. (2) Three hours of seminar and one hour of group meetings per week. Must be taken on a pass/not pass basis. Prerequisites: Consent of instructor; film majors only. Students will learn about film bibliography and research methodologies. Interns will get a thorough orientation to the Pacific Film Archive library through introductory lectures and training sessions. Then, for three hours per week, they will help organize materials for indexation and cataloging. Interns will gain experience in library organization and film bibliography, as well as a broad knowledge of the kinds of film reviews and criticism found in a variety of sources. (F,SP) Staff

197B. Field Studies for Majors. (3) Course may be repeated for credit. Three hours of internship per week. Must be taken on a pass/not pass basis. Prerequisites: Consent of instructor; film majors only. The supervised field internship program may include experience in a broad range of pre- and post-production film and video production-related activities. The student will develop an area of specialization in the field and be supervised in their training with a member of the faculty on the film advisory committee. Faculty sponsor and student will establish individual meeting times and academic conferences. The student is expected to complete the course with a minimum grade of B+. (F,SP) Staff

197C. Film Curating Internship. (2) Two hours of fieldwork and one hour of discussion per week. Must be taken on a pass/not pass basis. Prerequisites: 25A or equivalent and consent of instructor. This internship will provide experience “behind-the-scenes” at the Pacific Film Archive. Interns will learn about film curating through creating a program of works by UC Berkeley students presented to PFA the following semester. Students will solicit films and videos, preview them, and make a final selection as a group. Students will write short analyses of local film exhibitions, on programs and will develop projects related to PFA’s ongoing exhibition program. (F,SP) Staff

197D. Field Study at Film Quarterly. (2) Two hours of fieldwork and one hour of discussion per week. Must be taken on a pass/not pass basis. Prerequisites: 25A or equivalent and consent of instructor. An internship will provide an introduction to the theory, history, and practice of film curating taught by Pacific Film Archive curators. What do curators do? How do they decide what to show? What is the role of film archives in the field of film and moving image study? Using the Pacific Film Archive and its programmers as a laboratory, students will go behind-the-scenes of the curatorial, production, and exhibition process. Students will learn how to program by doing. The course will culminate in a proposal for a comprehensive film series. (F,SP) Staff

200. Graduate Film Theory Seminar. (3) Three hours of seminar and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. Students may attend both traditional and recent critical approaches to systematic and historical study of film. Although we will emphasize contemporary structuralist-semiotic, psychoanalytical, and socio-critical methods, we will also study the classical debates in film theory about representation, filmic vs. literary signification, sexual difference, and the social function of images in modernism and post-modernism. The seminars will continue to explore the history from 1910 to 1980. (F,SP) Staff

201. Graduate Film Historiography. (3) Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. The theoretical and methodological issues raised by the recent practice of film historians will be introduced in seminars. Intended primarily for first-year film studies graduate students and other students interested in starting work on film history, the seminar provides both a theoretical overview of film historiography and an introduction to the practice of historically oriented film research. The first part of the course uses both overtly historiographic readings and film history examples to raise historical questions and get a thorough understanding of film analysis, exhibition, distribution, and funding. Classes will consist of technical lectures and hands-on workshops, creative exercises, seminar-style discussion and critique, film viewings, and class presentations on areas of interest. (F,SP) Staff

203. Film Studies Seminar. (2-4) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. A seminar introducing film studies graduate students to the field, the profession, and the faculty practicing film studies. Envisioned as a way for new students to learn what is expected of them and to help them to pass through the all-important last years of their training in an atmosphere of helpful camaraderie. Introduces students to the intellectual and professional requirements and the changing face of the Bay Area. By the end of the semester, students should gain an understanding of the expectations of their performance in graduate school, have identified the major goals on the way towards getting a Ph.D., and, depending on where they are in their studies, have begun to achieve those goals. (F,SP) Staff

204. Compact Seminar. (2) Course may be repeated for credit. Four hours of seminar (meeting two times per week). A compact seminar features a distinguished, short-term visitor with expertise in film and media. During the stay, the visitor meets intensively with graduate students, who then continue to work on research topics for the remainder of the semester. 

197. Field Study at the Pacific Film Archive. (2) Three hours of seminar per week. Prerequisites: 220. Students will develop and produce a film series offered in conjunction with the Pacific Film Archive. Possibly refining a series proposed in 220. PFA curators will have final approval of the series topic and the film/video selection. Students will locate and book all films, develop press copies for 120, conduct outreach, and introduce programs. Guest speakers will include local press, writers, and artists. Local film and video-makers will trace the history of a work from production through exhibition. (F,SP) Staff

230. Graduate Production Seminar. (2) Four hours of lecture and three to five hours of laboratory per week. Prerequisites: Graduate standing and consent of instructor. Intensive study of the basic elements of film and digital video production and post-production. Graduate students will develop a working knowledge of film and video production by hands-on production experience that will enable them to film and edit their own projects. They will also acquire training in editing and post-production techniques and learn how to program by doing. The course will culminate in a proposal for a comprehensive film series. (F,SP) Staff
The requirements for the M.A. in folklore include 20 necessarily required disciplines is highly desirable though not philosophy, psychology, and sociology. Consequen-
civalities and modernities. Also listed as Anthropology C262A. (F)
C262B. Theories of Traditionality and Modernity. (4) Course may be repeated for credit with different topic and different instructor. This seminar explores the emer-
gence of notions of tradition and modernity and their reproduction in Eurocentric epistemologies and polit-
cial institutions. It uses work by such authors as Ander-
son, Butler, Chakrabarty, Clifford, Derrida, Foucault, Latour, Mignolo, Pateman, and Poovey to critically reread foundational works published between the 17th century and the present—along with philosophical texts with which they are in dialogue—in terms of how they are imbricated within and help produce tradi-
tionalities and modernities. Also listed as Anthropology C262B. (SP)
298. Readings in Folklore. (3-6) Course may be repeated for credit. Individual conferences to be arranged.
299. Directed Research. (3-6) Course may be repeated for credit. Individual conferences to be arranged.

The Major
There is no undergraduate major in folklore.

Preparation for Graduate Study
The best preparation for the graduate program in folklore is a strong undergraduate record in one of the broad fields with which folklore is closely affiliated. Since it is a study of the human expres-
sion handed down by tradition rather than by writing, it is related to all departments that deal with literature, art, music. Since folklore also deals with the entire traditional culture of mankind as mani-
fested in customs and beliefs, it has close affilia-
tions with anthropology, design, history, linguistics, philos-
phy, psychology, and sociology. Conse-
quently, a good undergraduate education in any of these disciplines is highly desirable though not necessarily required.

The Graduate Program
The requirements for the M.A. in folklore include 20 units of which at least 10 must be graduate level (200 number) in folklore, and an M.A. thesis based upon field work or some other research project. (No courses are allowed for the thesis.) Stu-
dents must take at least one course in two of the following three areas: folk narrative, folk or ethnic music, folk or primitive art. As an introduction to the discipline, students must take Anthropology 160, The Forms of Folklore. In addition, all stu-
dents are required to take the interdisciplinary Folklore 250A-250B, Folklore Theory and Tech-
iques. The students must also demonstrate profi-
cency in reading at least one foreign language. German is perhaps the most useful language for folklore studies, but French, Spanish, or some lan-
guage intimately connected with the M.A. thesis may be approved to satisfy the language require-
ment. Questions on the requirements for the M.A. in folklore should be addressed to the graduate adviser in 205 Kroeber Hall.

Department Overview
The Department of French places primary emphases on instruction in French at all levels, and the major or its upper division courses are conducted entirely in that language. No majors and non-
minor, however, may write in English in any upper division course.

Note: Students should consult the current Course Listings (which are revised at the beginning of each semester) via our website at french.berkeley.edu.

The Major
Lower Division. Courses 1, 2, 3, 4, and 35 or their equivalents; eight upper division courses in French. Twelve upper division units must be taken in residence.
Upper Division. French 102; two courses chosen from 145-185; two courses chosen from two dif-
ent centuries (112-120); three electives. At least two of the upper division courses completed in ful-
fillment of French major course requirements must cover material focusing on the 18th century or ear-
lier (historical period requirement).

Honors Program (H195A-H195B), Senior majors in French with a GPA of 3.5 overall and in the majority in that language. No nonmajors and non-
minor, however, may write in English in any upper division course.

Minor
The Department of French offers four minor options: a general French minor, French literature, French civilization, and French language studies. Each minor requires five upper division units.

General Minor in French: French 102 and four upper division courses from 103-183 (see note below).

Minor in French Literature: French 102 and four courses from 103-126 or 140A-140D (see note, next page).

The Department of French does not offer instruction in Russian folklore.

Soraya Tafati, Ph.D. Emory University. Francophone literature, French intellectual history
†Bertrand Augst (Emeritus), Ph.D.
Assistant Professor
Mari McLaughlin, Ph.D. University of California, Berkeley
French and Romance linguistics, translation studies
Senior Lecturer
Françoise Sorgen (Emerita), Diplôme d’études supérieures

Chair: Michael Lucey, Ph.D.

Folklore
(College of Letters and Science)

Program Office: 110 Kroeber Hall, (510) 643-7934
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Director: Professor Charles Briggs

Professors
Ronelle Alexander, Ph.D. (Slavic)
Stanley Brandes, Ph.D. (Anthropology)
Charles Briggs, Ph.D. (Anthropology)
Benjamin Brinner, Ph.D. (Music)
Ronald Hendel, Ph.D. (Near Eastern Studies)
Shannon Jackson, Ph.D. (Theater, Dance, and Performance Studies)
John F. Lindow, Ph.D. (Scandinavian)
Constance Slater, Ph.D. (Spanish and Portuguese)
Bonnie Wade, Ph.D. (Music)
Laurie Wilkie, Ph.D. (Anthropology)

Associate Professor
Daniel F. Melia, Ph.D. (Rhetoric)

The Folklore Program
This program is designed to provide graduate stu-
dents with a competent knowledge of both the materials of folklore and the various methods of studying these materials. The program is an inter-
disciplinary one in which faculty members from both the humanities and the social sciences partic-
tipate. The scope of the courses is international. However, students may specialize in a particular genre, e.g., folktales, or in a particular area such as Russian folklore.

Courses C261. Theories of Narrative. (4) Three hours of sem-
in per week. Prerequisites: Open to undergraduate who have completed Anthropology 160. This course examines a broad range of theories that elucidate the formal, structural, and contextual properties of nar-
tives in relation to gestures, the body, and emotion; imagination and fantasy; memory and the senses; and space and time. It focuses on narratives at work, on the move, in action as they emerge from the matrix of the everyday preeminently, storytelling in con-
versation—as key to folk genres—the folklore, the legend, the epic, the myth. Also listed as Anthropology C261. (F, SP)
C262A. Theories of Traditionality and Modernity. (4) Course may be repeated for credit with different topic and different instructor. Three hours of seminar per week. Prerequisites: Graduate standing or con-
sent of instructor. This seminar explores the emer-
gence of notions of tradition and modernity and their reproduction in Eurocentric epistemologies and polit-
cial institutions. It uses work by such authors as Ander-
son, Butler, Chakrabarty, Clifford, Derrida, Foucault, Latour, Mignolo, Pateman, and Poovey to critically reread foundational works published between the 17th century and the present—along with philosophical texts with which they are in dialogue—in terms of how they are imbricated within and help produce tradi-
tionalities and modernities. Also listed as Anthropology C262A. (F)
C262B. Theories of Traditionality and Modernity. (4) Course may be repeated for credit with different topic and different instructor. This seminar explores the emer-
gence of notions of tradition and modernity and their reproduction in Eurocentric epistemologies and polit-
cial institutions. It uses work by such authors as Ander-
son, Butler, Chakrabarty, Clifford, Derrida, Foucault, Latour, Mignolo, Pateman, and Poovey to critically reread foundational works published between the 17th century and the present—along with philosophical texts with which they are in dialogue—in terms of how they are imbricated within and help produce tradi-
tionalities and modernities. Also listed as Anthropology C262B. (SP)

The Minor
Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and adminis-
tratively distinct from their major.

The Department of French offers four minor options: a general French minor, French literature, French civilization, and French language studies. Each minor requires five upper division units.

General Minor in French: French 102 and four upper division courses from 103-183 (see note below).

Minor in French Literature: French 102 and four courses from 103-126 or 140A-140D (see note, next page).

The Department of French offers four minor options: a general French minor, French literature, French civilization, and French language studies. Each minor requires five upper division units.

Minor in French Literature: French 102 and four courses from 103-126 or 140A-140D (see note, next page).

The Department of French offers four minor options: a general French minor, French literature, French civilization, and French language studies. Each minor requires five upper division units.

Minor in French Literature: French 102 and four courses from 103-126 or 140A-140D (see note, next page).
Minor in French Civilization: French 102 and four courses from 140A-140D or 150-189 (see note below).

Minor in French Language Studies: French 102 and four courses from 130-139 or 145-149, and 35A (Placement).

Note: All minor courses must be taken for a letter grade. Conversation courses cannot be included as electives. One course each from French 102, 103A-103B, and 140A-140D may be counted toward the major or minor programs.

Graduate Study

The graduate programs in the Department of French blend strong coverage in the traditional, historically based divisions of French literature and culture with a wide array of ancillary fields and topics—from psychoanalysis, linguistics, and philosophy to the study of gender, law, historiography, visual arts and film, music, popular culture, feminism and science and politics.

Both the Ph.D. Program in French Literature and the Ph.D. Program in Romance Languages and Literatures enable students to undertake original research, engage in scholarly and critical writing in the foreign language, and prepare them for teaching careers at the college and university level.

The Ph.D. Program in French Literature. This program is divided into two phases, the M.A. (the first two years of graduate study) and the Ph.D. (thereafter). For the master’s degree, students take four courses of 4 units each (including French 270). The remaining courses are chosen in consultation with the graduate adviser to ensure historical coverage and to prepare students for the master’s exam. (Note: The department does not admit students who intend to pursue only the M.A. degree.)

Upon completion of the M.A. phase, students must: (1) take a minimum of six more courses, for a total of 14; (2) fulfill the foreign language requirement either through examination or through the successful completion of two upper division or graduate courses in a foreign language (other than French) which has bearing on the students’ courses of study; (3) pass a written and oral qualifying examination in three areas of study based on the students’ interests and reading lists developed in consultation with faculty; and (4) complete a dissertation.

Ph.D. in Romance Languages and Literatures (Emphasis in French). Students admitted for this degree have a choice of three plans of study:

Plan I includes a detailed knowledge of French literature and philology, a second Romance language as a collateral field, and knowledge of a prescribed list of masterworks in a third Romance language. Plan II requires a detailed knowledge of French literature and philology, and the command of one broad integrated field (period, movement, or genre) in two other Romance literatures, to be chosen by the student and the graduate adviser in accordance with the student’s special interest in French. Plan III requires an in-depth knowledge of the structure and history (internal and external) of French, and two collateral fields in Spanish and Italian. The candidates take such courses as they are necessary for the degree necessary in light of the approved plan and program. Language requirement: Latin, French, Italian, and Spanish. Knowledge of German is recommended.

Designated Emphasis. Graduate students may also participate in a Designated Emphasis (DE) as part of their graduate study. DEs in which French graduate students have enrolled include critical theory; film studies; and gender, women, and sexuality. Students obtaining a DE must fulfill additional course and other requirements. Students interested in completing a DE as part of their graduate study in French or in Romance languages and literatures (French emphasis) should consult the French student services adviser early in their graduate career.

For more detailed information concerning these programs, students should consult the department.

Lower Division Courses

1. Elementary French. (5) Five hours of lecture and one hour of laboratory per week. Introduction to speaking, listening, reading, and writing in French. (F,SP)

R1A. English Composition in Connection with the Reading of Literature. (4) Three hours of lecture per week. This course is designed to fulfill the first half of the Reading and Composition requirement. The primary goal is to develop students’ reading and writing skills through a series of assignments that will provide them with the opportunity to formulate observations made in class discussions into coherent argumentative essays. Emphasis will be placed on the refinement of effective sentence, paragraph, and thesis formation, keeping in mind the notion of writing as a process. Other goals in this course are a familiarization with French literature and the specific questions that are relevant to this field. In addition, students will be introduced to different methods of literary and linguistic analysis in their nonliterary readings. Emphasis will be placed on the reading and writing of sentences, paragraphs, and essays. (F,SP)

R1B. English Composition in Connection with the Reading of Literature. (4) Three hours of lecture per week. This course is designed to fulfill the second half of the Reading and Composition requirement. The primary goal of this course is to develop students’ reading and writing skills through a series of assignments that will provide them with the opportunity to formulate observations made in class discussions into coherent argumentative essays. Emphasis will be placed on the refinement of effective sentence, paragraph, and thesis formation, keeping in mind the notion of writing as a process. Other goals in this course are a familiarization with French literature and the specific questions that are relevant to this field. In addition, students will be introduced to different methods of literary and linguistic analysis in their nonliterary readings. (F,SP)

2. Elementary French. (5) Five hours of lecture and one hour of laboratory per week. Introduction to speaking, listening, reading, and writing in French. (F,SP)

2G. French for Graduate Students, Advanced. Three hours of lecture per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to freshmen. (F,SP)

35. Practical Phonetics and Listening Comprehension. (3) Three hours per week. Prerequisites: 3. This multimedia course concentrates on pronunciation and listening comprehension skills and provides a new understanding of the French language. Course website includes a wide variety of material: text, audio, or video, authentic or specifically recorded for the course; an audio-visual sound chart; and a multimedia reference section. International phonetic symbols and theoretical concepts are taught as necessary. Strongly recommended before study, work, or travel in French-speaking countries, particularly for Education Abroad Program students. Course required for French majors and minors in French language studies. (F,SP)

39. Freshman/Sophomore Seminar. (2-4) Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars are designed to offer division of students a way to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

43B. Aspects of French Culture. (3) Three hours of lecture per week. Formerly 43. Various historical and aesthetic themes and problems in the development of French civilization. In English. (F,SP)

Upper Division Courses

102. Reading and Writing Skills in French. (4) Three hours of lecture per week. Prerequisites: 4 (taken at an appropriate level for a student’s major or minor) or equivalent. (may be taken concurrently with 103). An exploration of the ways words and images structure thought, communication and interactions of the subject and society. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

103A-103B. Language and Culture. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Discussion and composition based on the analysis of literary and cultural texts. (F,SP)

112A-112B. Medieval Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 43. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

110A-110B. French Civilization. (3-3) Three hours of lecture per week. Prerequisites: 102 or equivalent. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

114A-114B. Late Medieval Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

112A-112B. Medieval Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 43. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

112A-112B. Medieval Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 43. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

114A-114B. Late Medieval Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Development of reading and writing skills leading to correct and effective expression in French. (F,SP)

116A-116B. Sixteenth-Century Literature: Marot to Montaigne. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Poetry and prose of the first half of the 16th century, in the context of the intellectual and aesthetic trends of the time, including humanism, evangelism, and the development of a new poetic language. (F,SP)

117A-117B. Seventeenth-Century Literature. (4-4) Three hours of lecture per week. Prerequisites: 102 or equivalent. A. Authors from the first half of the 17th century. The Baroque; its chief exponents, literary attempts to resolve the crisis in Renaissance values, formulation of new concepts in philosophy and psychology, experiments with traditional forms in poetry, fiction, and the theatre. Preciosity, Descartes, and Rationalism.
B. The concept of classicism and the development of tragedy. Jansenism, the doctrine of Port-Royal. Social satire and comedy. (F,SP)

118A-118B. Eighteenth-Century Literature. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent.

A. Authors from the first half of the 18th century, with emphasis on the origins of the philosophical movement and the development of modern art forms in the theater and the novel.

B. A study of authors of the second half of the 18th century stressing the importance of the "Movement Philosophique" and the development of libertine values as well as the emergence of the pre-Romantic aesthetics. (F,SP)

119A-119B. Nineteenth-Century Literature. (4,4) Course may be repeated once for credit if topic varies. Course may be repeated for a maximum of 8 units. Three hours of lecture per week. Prerequisites: 102 or equivalent.

A. Authors from the first half of the 19th century. Romantic poetry and drama. Balzac, Stendhal and the novel. Michelet and the emergence of history.

B. Authors from the second half of the 19th century. The various poetic movements: Le Parnasse and Symbolism. Development of the novel, Realism, and Naturalism. (F,SP)

120A-120B. Twentieth-Century Literature. (4,4) One course from 120A-120B may be repeated for credit, for a maximum of 8 units, with a different topic and consent of the undergraduate advisor. Three hours of lecture per week. Prerequisites: 102 or equivalent.

A. The modern novel, the avant-garde, cubist poetry, Dada and Surrealism, the theatre before World War II.

B. Development of the novel, poetry, and theatre since World War II. Sartre and Existentialism, Theatre of the Absurd, nouveau roman. (F,SP)

121A-121B. Literary Themes, Genres, and Structures. (4,4) One course may be repeated once for credit if topic varies. Three hours of lecture per week. Prerequisites: 102 or equivalent. Topics vary from year to year. Past topics have included "literature fantaisique," science fiction, autobiography, French lyric poetry, French lyric poetry. (F,SP)

123. Prose Fiction. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in the French novel. (F,SP)

126. Senior Seminar. (4) Course may be repeated once for credit, for a maximum of 8 units, if topic varies. Three hours of lecture per week. Prerequisites: 102 or equivalent. Intensive study of a major author. (F,SP)

130. Writing in French. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Advanced language, intended to elaborate vocabulary and increase ability with French through examples, illustrations and close study of short literary excerpts. In-depth corrections of compositions, and occasional debates. (F,SP)

131A. Translation and Debate. (3) Three hours of lecture per week. Prerequisites: 102 or the equivalent, or consent of instructor. In-depth knowledge of the French language and accuracy in its use are the goals of this course. A textbook and systematic exercises will be used to assist in the demanding task of translating, both from English to French and from French to English. (F,SP)

137. French for Economics, Politics, and Business. (3) Three hours of lecture per week. Prerequisites: 102 or equivalent. Introduction to the French vocabulary and syntax specific to economics, politics, and business. Oral and written comprehension, written compositions (including correspondence), translations, training in oral expression. Conducted entirely in French. (F,SP)

138. French for Future Teachers of the Language. (4) Three hours of lecture per week. Prerequisites: 35 and 102, or consent of instructor. Introduction to applied linguistics, for students planning to use their French in language teaching or related careers. In this course, we will begin with a general account of the French language—its phonology, morphology, and syntax—and we will subsequently consider specific issues in the learning and teaching of French. We will also examine techniques used for foreign language teaching methods. Students should have a working knowledge of both oral and written French. (F,SP) Kern

140B-140D. French Literature in English Translation. (4,4) Three hours of lecture per week. Major topics in French literature. Reading and writing assignments in English for non-majors; in French for French majors and minors. Class discussions in English. A. The Middle Ages. B. The Ancien Régime. C. The 19th Century. D. Modern Literature. (F,SP)

141. French Studies in an International Context. (4) Four hours of lecture per week. Prerequisites: For French majors and minors only; 102 or consent of instructor. An examination of a theme, issue, or concept from French literary, intellectual, or cultural history in its interaction with its context. Writing assignments and readings in English for non-majors; writing assignments and French readings in French for French majors and minors. Class discussions in English. Topics vary from year to year. (F,SP) Staff

142AC. The Cultures of Franco-America. (4) Three hours of lecture per week. Literary and cultural texts that emerge out of the long history of the French in North America and of Americans in France. Topics may vary from semester to semester, but the course will always take substantial account of the experiences and histories of representations of different ethnic groups. Students should consult the department's calendar well before the beginning of the semester for details. This course satisfies the American Cultures requirement. (F,SP) Staff

149. History of the French Language. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 132. Mainly devoted to "external history" of French, tracing spread of Latin to what is now France, its break-up into different languages and dialects, emergence of Parisian French as standard. Influence of other languages on French vocabulary. Study of brief texts from different periods to illustrate evolution of pronunciation and grammar. (F,SP)

146A. Introduction to French Linguistics. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Formerly 176A-176B. An introduction to the major branches of linguistic analysis (phonology; morphology; syntax; and semantics) as applied to the French language. (F,SP)

147. Special Topics in French Linguistics. (4) Course may be repeated once for credit as topic varies. Three hours of lecture per week. Prerequisites: 102; 146; or consent of instructor. Formerly 133. Topics vary from year to year. (F,SP)

150A-150B. Women in French Literature. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. A study of the portrayal of women in French literature and of the contributions of women to French literature and thought. (F,SP)

151A-151B. Francophone Literature. (4,4) Course may be repeated once for credit as topic varies. Three hours of lecture per week. Prerequisites: 102 or equivalent. A study of Francophone literature: traditional and French influence at moments of cultural transition. Topics vary from year to year. (F,SP)

161-161B. A Year in French History. (4,4) One course from 161A-161B may be repeated once for credit with a different topic and with consent of the undergraduate adviser. Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Formerly 151-151B. Only in areas not covered by courses. (F,SP)

162A-162B. Perspectives on History. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. This course will study both contemporary and subsequent reactions to historic events or figures. Topics vary from year to year. (F,SP)

170. French Films. (4) Hours of lecture and two hours of studio per week. Prerequisites: 102 or equivalent. Beginning French cinema studies: the language of film. (F)

171A-171B. A Concept in French Cultural History. (4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. An examination of certain large cultural concepts, such as "the Baroque" or "Romanicism," in French cultural history. Topics vary from year to year. (F,SP)

172A. Psychoanalytic Theory and Literature. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. The relevance of psychoanalysis to literary texts. Concepts of fantasy, the self, and desire applied to texts by Racine, Balzac, Lautreamont, Rimbaud, and Proust. (F,SP)

175A. Literature and the Visual Arts. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Using various works from the arts and the human sciences, this course will investigate the relations between images and written texts. (F,SP)

177A-177B. History and Criticism of Film. (4,4) Four hours of lecture and two hours of discussion per week. Prerequisites: 102 or equivalent; 170 or equivalent. The development of French cinema. Discussions, oral and written reports will be based on the viewing of films from the work of major French film directors. (F,SP)

180B-180D. French Civilization. (4,4,4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Survey of French civilization: history, arts, and society, through the interpretation of literary texts. One course from 180A-180B-180C-180D is required for completion of the Option B French major. 180A: The Ancient Regime; 180B: The Ancien Régime; 180C: The 19th Century; 180D: The 20th Century. (F,SP)

183A-183B. Configurations of Crisis. (4,4) Course may be repeated once for credit with different topic. Course may be repeated for a maximum of 8 units. Three hours of lecture per week. Prerequisites: 102 or equivalent. A study of the pressures on artistic, political, and economic structures at moments of crisis in French history. Problems of continuity and discontinuity in esthetic and social history. (F,SP)

185. Literature and Colonialism. (4) Three hours of lecture per week. Prerequisites: 102 or equivalent. Studies in the literature developed in France at the height of the colonial era. Theory of travel, exotisme, neo-civilisation, the reaction of European countries to the discovery of Africa. (F,SP)

H195A-H195B. Honors Sequence. (2,2) Credit and grade to be awarded on completion of sequence. Prerequisites: Open to seniors majoring in French who meet the GPA requirements, with the consent of major adviser. Students will write an essay on a topic relating to French literature or culture under the supervision of a member of the faculty during two semesters of their senior year. (F,SP)

197. Field Studies. (1-4) Course may be repeated for credit. Two hours of fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised field programs involving experiences in schools and school-related activities. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

199. Supervised Independent Study and Research for Advanced Undergraduates. (2-4) Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Restricted to seniors and seniors of 3.0 and GPA of 3.0 in French. Enrollment restricted according to college regulations. Individual instruction only in areas not covered by courses. (F,SP)
C202. Linguistic History of the Romance Language. (4) Three hours of lecture per week. Prerequisites: Knowledge of at least two major Romance languages (French, Italian, and Spanish). Linguistic development of the major Romance languages (French, Italian, and Spanish) from the common Latin origin. Comparative perspective, combining historical grammar and external history. Also listed as Italian Studies C201 and Spanish C202. Staff

204. Oral and Written Discourse in French. (4) Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Study of narrative structures and theories of rhetoric in the French language, for non-native speakers of French. Close analysis of texts and weekly writing assignments. (F,SP)

206. Special Topics in French Linguistics. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Topics may vary from semester to semester. (F,SP)

210A. Studies in Medieval Literature. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. Students should consult the department’s course description for current topics.

211A. Reading and Interpretation of Old French Texts. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. Current topics may be found in the department’s course description.

220A-220B. Studies in 16th-Century Literature. (4;4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topics.

230A. Studies in 17th-Century Literature. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topics.

240A. Studies in 18th-Century Literature. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topic.

245A-245B. Early Modern Studies. (4;4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topic.

250A-250B. Studies in 19th-Century Literature. (4;4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topic.

251. Francophone Literature. (3) Three hours of seminar per week. Focuses upon the relationship between Francophone cultures in Francophone Africa and/or the Caribbean: lyric and narrative poetry, drama and novels; the presence of oral tradition in written forms; narrative techniques borrowed from storytelling tradition; the definition of traditional metaphors and image-patterns in literature; and implications of traditional culture and modernism; the search for political identity and independence.

260A-260B. Studies in 20th-Century Literature. (4;4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topics.

265A-265B. Modern Studies. (4;4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topics.

270A-270B. Literary Criticism: Recent Work in French. (4;4) Three hours of seminar per week. A close investigation of a number of important critical works in the field of French, including an examination of the various other texts (literary and critical) with which they engage. Orient students to the varied field of French studies and develops the critical and research skills necessary for advanced work in the field.

275A. Problems of Literary Theory. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Offerings vary from year to year. See the department’s course description for current topics.

282. French Literary and Social History. (4) Three hours of seminar per week. An analysis of patterns and trends in the literature and culture of France.

298. Special Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Designed for students engaged in exploration of a restricted field, involving the writing of a report. May not be substituted for available graduate courses.

299. Individual Research. (4;12) Course may be repeated for credit. Individual conferences. Reserved for students directly engaged in writing the doctoral thesis.

301. Special Study for Graduate Students. (1-12) May not be used to satisfy units or residence requirements. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive examination in consultation with the field adviser.

302. Teaching French in College: First Year. (4) Three hours of lecture and attendance at demonstration class for five hours per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For graduate students teaching at college level. Biweekly lectures on methodology, grading and testing, demonstration class with required attendance five times per week; language laboratory observations; supervised classroom practice. Additional seminars and discussion sections on methodology. Required for all graduate student instructors teaching French 1 for the first time.

303. Teaching French in College: Second Year. (4) Course may be repeated for credit. Three hours of lecture and one hour of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate students. Required of all GSIs teaching French 35 for the first time. (F,SP) Pries

335. Teaching French in College: Practical Phonetics and Listening Comprehension: A Report on Creating a Written Course. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate students. Required of all GSIs teaching French 35 for the first time. Must be taken on a satisfactory/unsatisfactory basis. May not be used to satisfy units or residence requirements. Individual conferences. Reserved for graduate student instructors teaching French 3 or 4. (F,SP) Pries

345. Teaching French in College: Advanced First Year. (4;4) Three hours of lecture and attendance at demonstration class for five hours per week. Must be taken on a satisfactory/unsatisfactory basis. Biweekly lectures on methodology, grading, and testing, in French 2. Discussion, with required attendance five times per week; laboratory observations; supervised classroom practice. Additional seminars and discussion sections on methodology. Required for all student instructors teaching French 1 or 2 for the first time.

350. Teaching French in College: Advanced Second Year. (4;4) Three hours of lecture and attendance at demonstration class for five hours per week. Must be taken on a satisfactory/unsatisfactory basis. Biweekly lectures on methodology, grading, and testing, in French 3 or 4. Discussion, with required attendance five times per week; laboratory observations; supervised classroom practice. Additional seminars and discussion sections on methodology. Required for all student instructors teaching French 3 or 4. (F,SP) Pries

Affiliated Faculty
Elizabeth Abel, Ph.D. (English)
Kimberly Ainsworth, Ph.D. (Environmental Science)
Alice M. Agogino, Ph.D. (Mechanical Engineering)
Katherine Albiston, Ph.D. (History of Art)
Emille C. Bergmann, Ph.D. (Spanish and Portuguese)
David Boykine, Ph.D. (Near Eastern Languages and Literatures)
Karl A. Belto, Ph.D. (French/Comparative Literature)
Wendy Brown, Ph.D. (Political Science)
Judith Butler, Ph.D. (Comparative Literature)
Barbara Cahan, Ph.D. (Environmental Studies)
Keren A. Chaudhry, Ph.D. (Political Science)
Sheng Chen, Ph.D. (Rhetoric)
Catherine Cerza Choy, Ph.D. (Ethnic Studies)
Laurie M. Cohen, Ph.D. (Women's Studies)
Margaret Conkey, Ph.D. (Anthropology)
Vasudha Dalmia, Ph.D. (South and Southeast Asian Studies)
Whitney Davis, Ph.D. (History of Art)
Louise A. fortnham, Ph.D. (Environmental Science, Policy, and Management: Society and Environment)
The Department of Gender and Women's Studies offers interdisciplinary perspectives on the formation of gender and its intersections with other relations of power, such as sexuality, race, class, nationality, religion, and age. Questions are addressed within the context of a transnational world and from perspectives as diverse as history, sociology, literary and cultural studies, postcolonial theory, science, new technology, and art. The undergraduate program is designed to introduce students to gender and women's studies, focusing on gender as a category of analysis and on the role of sex in shaping social and historical life. The department offers an introduction to feminist theory as well as more advanced courses that seek to expand capacities for critical reflection and analytical exercises. Students must complete five upper division courses in gender and women's studies, students must complete GWS 10. Minors in gender and women's studies must complete five upper division courses as follows: any three of the core courses (GWS 101, 102, 103, 104) plus two electives in gender and women's studies. A minimum GPA of 2.0 is required for the minor program.

**Prerequisites for Nonmajors and Minors**

Students who are not majoring or minoring in gender and women's studies but wish to take gender and women's studies core courses (101, 102, 103, and 104) must take GWS 10, or their equivalent beforehand.

**Graduate Program—Designated Emphasis in Women, Gender, and Sexuality**

Ph.D. students may add a Designated Emphasis in women, gender, and sexuality (DEWSG) to their major fields. Designated emphasis interdisciplinary graduate studies at Berkeley, the DEWSG provides curricular and research resources and opportunities to students who are already admitted to graduate degree programs on campus. The DE program was developed to accommodate some of the many students who conduct graduate-level research in related topics across numerous fields. Administered by the Department of Gender and Women's Studies, the DE program provides its students with certification as well as a context for the interdisciplinary exchange of ideas and development of research.

**Major Program**

**Prerequisites.** To declare the gender and women's studies major, students must have completed GWS 10 and 20 and have a minimum GPA of 2.0.

**Upper Division Requirements.** The requirements for a gender and women's studies major consist of a minimum of eight upper division courses on gender and women's issues (30-32 units) distributed as follows:

- Electives (10-12 units): Three electives, at least one in the Department of Gender and Women's Studies. The other two may be fulfilled by classes offered by other departments that are listed in Courses on Gender and Women, published each semester by the Department of Gender and Women's Studies.

**Honors Program.** Students must have a 3.3 for honors, and a 3.7 for highest honors in all courses. In addition to these core courses, students are required to take two electives approved each year by the director and posted online. Teaching is largely done by 12 ladder-rank faculty.

**Minor Programs**

Gender and Women's Studies. Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their primary major. Students who are already admitted to gender and women's studies, students must complete GWS 10. Minors in gender and women's studies must complete five upper division courses as follows: any three of the core courses (GWS 101, 102, 103, 104) plus two electives in gender and women's studies. A minimum GPA of 2.0 is required for the minor program.

Lesbian, Gay, Bisexual, and Transgender (LGBT) Studies. This minor is organized around four core courses: an introductory overview of LGBT culture and history in the United States; a visual and literary studies course; a cross-cultural studies course; and a history of sexuality course. In addition to these core courses, students are required to take two electives approved each year by the director and posted online. Teaching is largely done by 12 ladder-rank faculty.

**Further Information**

For more information, see the online Schedule of Classes and the department's course descriptions issued before the start of each semester. The online Course Guide provides detailed, up-to-date information about courses offered by the Department of Gender and Women's Studies.

For more information about the department, events, and links to other sites of interest, visit womensstudies.berkeley.edu.
24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Three hours of seminar per semester. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Formerly Women’s Studies 24. The Freshman Seminar program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP) Staff

25. Gender and Science. (4) Three hours of lecture per week. Examines the role of gender in “development.” Addresses theories of gender, sexuality, class, nation, and race from late 18th-century racial and gender classifications through the heyday of eugenics to today’s genomics. Explores the embedding of the scientific study of gender and sexuality in medical, political, economic, and social contexts. Considers different theories for the historical underrepresentation of women and minorities in science, as well as potential solutions. Introduces feminist science studies, and discusses technologies of production, reproduction, and destruction that draw on as well as remake gender locally and globally. (F,SP) Staff

26. Feminist Ethnography. (4) Three hours of lecture/discussion per week. Feminist Ethnography is a seminar about feminist fieldwork and fieldwriting. It engages with genealogies of transnational feminist perspectives on health care disparities, the medicalization of society, and transnational processes relating to gender. Gender will be considered in dynamic interaction with race, ethnicity, sexuality, on consumption status, religion, nation, age, and disability, and in both urban and rural settings. This course satisfies the American Cultures requirement. (F,SP) Staff

27. Feminist Theory. (4) Three hours of lecture/discussion per week. Formerly Women’s Studies 104. Feminist theory examines the basics categories that structure social life and that condition dominant modes of thought. Feminist theory engages with many currents of thought such as liberalism, Marxism, psychoanalysis, postcolonial theory, and transnational feminist theory. In this course, students will gain a working knowledge of the range and uses of feminist theory. (F,SP) Staff

28. Special Topics. (1-4) Course may be repeated for credit. Three hours of course are offered in the Spring. Formerly Women’s Studies 40. The findings of feminist scholarship as they apply to a particular problem, field, or environment of feminist students and nonmajors. Topics will vary from semester to semester. Students should consult the department’s announcements of courses for specific semester topics. (F,SP) Staff

50AC. Gender in American Culture. (3) Course may be repeated for credit. Three hours of lecture per week. Formerly Women’s Studies 50AC. A multidisciplinary course designed to provide students with an opportunity to work with faculty investigating the topic gender in American culture. This course satisfies the American Cultures requirement. (F,SP) Staff

98. Directed Group Study for Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Formerly Women’s Studies 98. Seminars for the group study of selected topics not covered by regularly scheduled courses. Topics will vary from year to year. (F,SP) Staff

99. Supervised Independent Study and Research. (1-12) Course may be repeated for credit. Three to twelve hours of tutorial or fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Freshmen or sophomores only. Formerly Women’s Studies 99. Supervised individual research by lower division students only. (F,SP) Staff

Upper Division Courses

100AC. Women in American Culture. (3) Three hours of lecture per week. Formerly Women’s Studies 100AC. This course is designed to provide students with an opportunity to work with faculty investigating the topic women in American culture. This course satisfies the American Cultures requirement. (F,SP) Staff

101. Doing Feminist Research. (4) Three hours of lecture/discussion per week. Prerequisites: 10 and 20. Formerly Women’s Studies 101. This course introduces students to feminist research techniques, research methodologies, and feminist knowledge production. The course will focus on practices of gender in a particular domain such as labor, love, science, aesthetics, film, religion, and politics. The course is optional and varies depending on the instructor. (F,SP) Staff

102. Transnational Feminism. (4) Four hours of lecture/discussion per week. Formerly Women’s Studies 102. An overview of transnational feminist theories and practices, which addresses the workings of power that intersect across bodies, nation-states, and differences in resistance within and beyond the United States. The course engages with genealogies of transnational feminist theories, including analyses of women, gender, sexuality, “race,” racism, ethnicity, class, nation; postcolonial theory; globalization; area studies; and cultural studies. (F,SP) Staff

103. Identities Across Difference. (4) Four hours of lecture/discussion per week. Prerequisites: 10. Formerly Women’s Studies 103. The course studies identity formation as a product of self and other, rather than an inherited marking. Emphasis, for example, may be placed on the complexities of the lived experiences of women of color in the United States and in other parts of the world. (F,SP) Staff

104. Feminist Theory. (4) Three hours of lecture/discussion per week. Prerequisites: 10 and 20. Formerly Women’s Studies 104. Feminist theory examines the basic categories that structure social life and that condition dominant modes of thought. Feminist theory engages with many currents of thought such as liberalism, Marxism, psychoanalysis, postcolonial theory, and transnational feminist theory. In this course, students will gain a working knowledge of the range and uses of feminist theory. (F,SP) Staff

111. Special Topics. (1-4) Course may be repeated for credit as topic varies. One to three hours of course per week. Formerly Women’s Studies 111. This course is designed to provide students with an opportunity to work closely with Gender and Women’s Studies faculty, investigating a topic of mutual interest in depth. Emphasis in on student discussion and collaboration. Topics will vary from semester to semester. Number of units will vary depending on specific course format, and requirements. (F,SP) Staff

115. Engaged Scholarship in Women and Gender. (4) Two hours of lecture/discussion and three hours of internship per week. Three hours of lecture per week. This class provides the opportunity for an internship in an organization that relates to women and gender. Students will be placed in an organization and complete an internship throughout the course of the semester. Students will reflect on their internship experiences, connecting their service with concepts learned in gender and women’s studies classes, and meeting as a group to evaluate and assess issues of volunteer/ paid labor, activism and the academy, and the political economy of gender and women’s services. (F,SP) Staff

120. The History of American Women. (4) Three hours of lecture per week. Formerly Women’s Studies 120. This course will survey the history of women in the United States from the history of the present, a century of dramatic and fundamental change in the meaning of gender difference. We will examine such topics as work, the family, sexuality, and politics and be guided by the structure and experience of gender based on race, ethnicity, and class. (F,SP) Staff

125. Women and Film. (4) Three hours of lecture and two hours of screening per week. Prerequisites: 10 and 20. Formerly Women’s Studies 125. This course explores the role of women both in front of and behind the camera. Students will analyze constructed nature of gender representations in film and analyzes the position of women as related to the production and reception of films. Emphasis is on feminist approaches that challenge traditional working of patriarchy in cinema. (F,SP) Staff

126. Film, Feminism, and the Avant-Garde. (4) Three hours of lecture per week. Formerly Women’s Studies 126. Focusing on the creative process while engaging in critical debates on politics, ethics, and aesthetics, the course explores the site where feminist film-making practice meets with and challenges the avant-garde tradition. It emphasizes works that question conventional notions of subjectivity, audience, and interpretation. May be repeated for credit. (F,SP) Staff

129. Bodies and Boundaries. (4) Three hours of lecture/discussion per week. Formerly Women’s Studies 129. Examines gender and embodiment in interdisciplinary transnational perspective. The human body as both a source of pleasure and as a site of coercion, which expresses individuality and reflects social worlds. Looks at bodies as gendered, raced, disabled/able-bodied, young or old, rich or poor, fat or thin, commodity or inalienable. Considers masculinity, women’s bodies, sexuality, sports, clothing; bodies constrained, in leisure, at work, in nation-building, at war, and as feminist theory. (F,SP) Staff

130AC. Gender, Race, Nation, and Health. (4) Three hours of lecture per week. Formerly Women’s Studies 130AC. The course explores the intersections of gender in health care status, in definitions and experiences of health, and in practices of medicine. Feminist perspectives on health care disparities, the medicalization of society, and transnational processes relating to health. Gender will be considered in dynamic interaction with race, ethnicity, sexuality, on consumption status, religion, nation, age, and disability, and in both urban and rural settings. This course satisfies the American Cultures requirement. (F,SP) Staff

131. Gender and Science. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly Women’s Studies 131. This course examines historical and contemporary scientific studies of gender, sexuality, class, nation, and race from late 18th-century racial and gender classifications through the heyday of eugenics to today’s genomics. Explores the embedding of the scientific study of gender and sexuality in medical, political, economic, and social contexts. Considers different theories for the historical underrepresentation of women and minorities in science, as well as potential solutions. Introduces feminist science studies, and discusses technologies of production, reproduction, and destruction that draw on as well as remake gender locally and globally. (F,SP) Staff

133AC. Women, Men, and Other Animals: Human Animality in American Cultures. (4) Three hours of lecture/discussion per week. This course introduces students to two fundamental ways that human groups and interests, particularly in the United States, have both attached and divorced themselves from other animals, with particular focus on animal rights, ability, disable, and the definitional foils for human engagements with animality. This course satisfies the American Cultures requirement. (F,SP) Staff

134. Gender and the Politics of Childhood. (4) Three hours of lecture/discussion per week. Formerly Women’s Studies 134. Explores gender and age as interrelated dimensions of social structure, meaning, identity, and embodiment. Emphasis on the gendered politics of childhood—for example, the construction of reproduction; child-rearing, motherhood, fatherhood, care, and rights; the changing global political economy of childhoods and various constructions of the “child”; child laborers, soldiers, street children; consumption by and for children, schools, neighborhoods, and families. (F,SP) Staff

139. Women and Work. (4) Three hours of lecture/discussion per week. Formerly Women’s Studies 139. This course uses gender as a lens to examine the nature, meaning, and organization of women’s work. Students learn varied conceptual approaches with which to probe such issues as gender divisions of labor, the economic significance of caring and other forms of unpaid labor, earnings disparities between men and women, race and class differences in women’s work, transnational labor migration, and worker resistance and organizing. (F,SP) Staff

140. Feminist Cultural Studies. (4) Three hours of lecture per week. Formerly Women’s Studies 140. This course introduces students to feminist perspectives in all disciplinary fields of feminist cultural studies. Drawing upon contemporary theoretical representations of politics, the specific focus of the course will vary, but the emphases will remain on the intersection of gender, race, nation, sexuality, and class in particular cultural and critical practices. (F,SP) Staff

141. Interrogating Global Economic “Development.” (4) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Formerly Women’s Studies 141. This course engages with gender and gender in “development.” Addresses theories of “develop-
Cultural Representations of Sexualities: Queer Visual Culture. (3) Three hours of lecture discussion per week. Formerly Women’s Studies C146. This course examines modern visual cultures that construct ways of seeing diverse sexualities. Considering Western conventions of representation during the modern period, we will investigate film, television, and video. How and when do “normative” and “queer” sexualities become visually defined? Also listed as Lesbian Gay Bisexual Transgender C146.

C146A. Cultural Representations of Sexualities: Queer Literary Culture. (3) Three hours of lecture discussion per week. Formerly Women’s Studies C146A. This course examines modern literary cultures that construct ways of seeing diverse sexualities. Considering Western conventions of representation during the modern period, we will investigate the social forces and institutions that would be necessary to sustain a newly imagined or re-imagined sexual identity across time. Also listed as Lesbian Gay Bisexual Transgender C146A.

C153A. Images of African American Women in Literature: Slavery to the 20th Century. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Reading and composition requirement. Formerly Women’s Studies C153A. Analysis of cultural, literary, and social assumptions that contribute to the various images of African American women in Western literature and African American writing. The course examines the 21st-century African American women, an exploding field in American literary discourse. Also listed as African American Studies C153A.

C153B. Contemporary Images of African American Women in Literature. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Reading and composition requirement. Formerly Women’s Studies C153B. Analysis of the cultural and social assumptions and dynamics that shape the image of the African American woman in contemporary Western African American writing. Also listed as African American Studies C153B.

C170. Selected Topics in Feminist Theory. (4) Course may be repeated for credit with consent of department. Three hours of lecture per week. Formerly Women’s Studies C170. This course focuses on one topic, problem, or intellectual movement in feminist theory. Topic will vary with instructor. (F,S,P) Staff


C210. Advanced Interdisciplinary Studies. (4) Three hours of lecture and one hour of seminar per week. Prerequisites: 104 or equivalent and consent of instructor. Formerly Women’s Studies 210. A cross-disciplinary examination of specific problems in the study of gender, women, and sexuality. This course examines new patterns of inequality as they relate to race, ethnicity, nation, religion, and power. The seminar will present their ongoing dissertation research and mutually explore the interdisciplinary and implications of their research. (F,S,P) Staff

C220. Research Seminar. (4) Three hours of lecture and one hour of seminar per week. Prerequisites: Open to graduate students advanced to Ph.D. candidacy. Formerly Women’s Studies 220. Members of the seminar will present their ongoing dissertation research and mutually explore the interdisciplinary and implications of their research. (F,S,P) Staff

C230. Transnational Feminist Theories. (4) Three hours of lecture discussion per week. The aim of this course is to provide graduate students with an understanding of feminist theories so that they may more effectively engage with this area of study. The seminar will present their ongoing dissertation research and mutually explore the interdisciplinary and implications of their research. (F,S,P) Staff

C231. Proseminar in Transnational Gender and Women’s Studies. (1) One hour of lecture per week. Prerequisites: Consent of instructor. Designed to encourage dialogue around themes related to transnational gender and women’s studies, this proseminar is organized around colloquia, panels, and conferences sponsored by the Department of Gender and Women’s Studies, the Beatrice Bain Research Group, the Center for Race and Gender, the Center for the Study of Sexual Cultures, and (as relevant) other campus units. (F,S,P)

C232. Transnational Feminist Approaches to Knowledge Production. (4) Three hours of lecture per week. This course focuses on incorporating the analytic power of transnational feminist studies in academic research projects and practices. It examines the ways in which transnational and international feminist approaches to gender and women replicate, challenge, reconfigure, and transform the emergence of new knowledge frames, analytics, and research practices. Students will explore the implications of these other questions in the context of their own research projects. (F,S,P)

C236. Diaspora, Border, and Transnational Identities. (4) Three hours of lecture per week. This course will study debates around the notions of home, location, migrancy, mobility, and dislocation by focusing on issues of gender and sexuality. We will examine the ways in which various cultural flows have fundamentally challenged and changed the nature of global economy by expanding mobility of capital, labor, and people through representations in contemporary context. We will also look at the impact of new technologies in production, distribution, communication, and circulation of cultural meanings and social identities by linking nationalism, immigration, diaspora, and globalization to the process of subject formation in a postcolonial context. (F,S,P)

C237. Transnational Science, Technology, and New Media. (4) Course may be repeated for credit. Three hours of lecture per week. This is a core class of the new Ph.D. in Transnational Gender and Women’s Studies. It will expose students to critical thinking about science, technology, and new media. The class will explore intersections of gender and women’s studies with computer science, technology, engineering, and new media around the world; including women in sci-
enence; transnational feminist science and technology studies; technologies of reproduction, production and destruction; divisions of scientific and technical labor; embodiment and subjectivity: digital divides, digital consumption, embodiment, and circulation; modernist projects of categorization; and the making and breaking of gendered bodies. It mixes secondary sources with primary sources, and among the primary sources, mixes scientific and technical documents with new media and the arts. (F,SP) Staff

238. Feminist Bio-Politics. (4) Three hours of seminar per week. This course is divided into three sections—Theorists and Methods, The Sciences of Life, and The Politics of Life. Within each section there are further thematic headings. The course serves both to introduce graduate students to science and technology studies and to introduce new works and directions in the field. The syllabus foregrounds the life and biomedical sciences, and thematizes space and trans-place, time and genealogy, disciplines and interdisciplines, method and/as theory, identity and gender, and increasingly knowledge, knowledge and stratification, security and transparency.

250. Queer Translation. (4) Three hours of seminar per week. This seminar aims for both a familiarization and a potential reworking of selected contemporary debates in queer theory: those concerning migration, race, globalization, and movements of theory. How do queer theories, queer theories-as-practice, queer practices travel? Furthermore, do critiques of stability found in queer theory invite supplementation or reformulation? How do we think about the relationship of "mobility" in queer theory by considering queer tourism, gender identity, sub-class labor migration, and the outer zones of citizenship. (F,SP)

299. Individual Study and Research. (1-9) Course may be repeated for credit. Regular meetings to be arranged by instructor and student. Prerequisites: Consent of instructor. Formerly Women's Studies 299. For students engaged in individual research and study. May not be substituted for available graduate lecture courses. (F,SP) Staff

Lower Division Courses

20AC. Alternative Sexual Identities and Communitie in Contemporary American Society. (4) Students will receive no credit for 20AC after taking Undergraduate Interdisciplinary Studies 20AC. Three hours of lecture and one hour of discussion per week. An introduction to varied dimensions of alternative sexual identities in the contemporary United States, with a focus on social, cultural, and political studies. This course will use historical, sociological, anthropological, psychological, psychoanalytical, legal, medical, literary, and filmic materials to chart hands, ethics and objectivity, turn toward the century to the present. This course satisfies the American Cultures requirement. (F,SP) Staff

98. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Undergraduate Interdisciplinary Studies section of this catalog. Three hours of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Gender and women's studies major. Seminars for group study of selected topics not covered by regularly scheduled courses. Topics will vary from year to year. (F,SP) Staff Upper Division Courses

100. Special Topics. (4) Course may be repeated for credit. One to three hours of lecture/discussion per week. This course is designed to provide students with an opportunity to work closely with LGBT faculty, investigating a topic of mutual interest in great depth. Emphasis on student discussion and collaboration. Topics will vary from semester to semester. Number of units will vary depending on specific course, format, and requirements. (F,SP)
their horizons over the past quarter century, three research foci have emerged to define geography at Berkeley:

1. **Earth system science** is concerned with understanding the interlocking subsystems of the natural environment (atmosphere, hydrosphere, biosphere, lithosphere, and cryosphere) in which we live and how they may change with time. Departmental research and teaching in this area aim to provide a complex picture of a dynamic and changing Earth, including landforms, the atmosphere, oceans, ice sheets, and ecosystems. Area strengths lie in climate change and variability, glacial aeolian processes, terrestrial biogeochemistry, paleoecology, Quaternary stratigraphy, atmospheric physics and chemistry, and paleoenvironmental reconstruction. Our scholarship blends an in-depth understanding of process with curiosity about large-scale geographical phenomena.

2. **Development and environment** is concerned with the social origins of natural resource use and abuse and the relation of economic growth to environmental quality around the world. Research and teaching in development and environment draw upon political ecology and social theory to explore the relations between natural and social systems, emphasizing the role of social forces in controlling over resources, property and management regimes, and systems of cultural meaning. Social emphasis is given to gendered practices, indigenous rights, religious signification, and the history of environmental thought.

3. **Local and global relations** is concerned with the intersection of global processes and locally situated systems of culture, politics, and economics at various spatial scales (urban, regional, national, international). Central concerns of local and global relations are shifting spatial patterns of industry, cities, and modern life. Research and teaching address global economic forces, state politics, racial formations, social movements, labor organization, and consumer cultures.

Geography students are expected to have diverse interests and independent thought. We welcome students from a variety of backgrounds, including those with professional experience who wish to deepen their education. Students are encouraged to range freely through the curriculum and to follow their inspiration where it leads, working in tandem with faculty advisers. Graduate students often use two or three faculty, in small measure (including faculty affiliates and members from other departments) and collaborate with faculty on research, writing, and teaching. We expect students to read extensively, develop their research, technical, and teaching skills; and produce well-crafted papers, projects, and dissertations.

### The Undergraduate Major

#### Lower Division

Majors take three lower division courses, one of which must be 1 or 40. The other two must be chosen from the following (one from each group): 10, 20, 30, 50AC or 51. (Transfer students should consult with the undergraduate adviser to avoid repeating lower division work.)

#### Upper Division

Majors take at least eight upper division courses. There are two configurations to choose from:

- **5-2-1-option:** Four courses must be in one specialty group and two from the other. One course from the Methodology group must also be completed. Everyone choosing the Earth system science focus must take Geography 140A (Physical Landscapes: Process and Form). Everyone choosing the geography of economy, culture, and society focus must take Geography C110 (Economic Geography of the Industrial World) or C130 (Natural Resources and Population).
- **4-2-2-option:** Four courses must be in one specialty group and two from the other. Two courses from the Methodology group must also be completed. Everyone choosing the Earth system science focus must take Geography 140A (Physical Landscapes: Process and Form). Everyone choosing the geography of economy, culture, and society focus must take Geography C110 (Economic Geography of the Industrial World) or C130 (Natural Resources and Population).

The **Minor**

Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field different from and administratively distinct from their major.

**Required:** A minimum of five upper division courses, all taken for a letter grade. Students must maintain an overall GPA of 2.0 for all courses taken for the minor.

**The Doctoral Program**

All students take Geography 200A-200B in the first year and must take at least 8 units every semester (primarily in the form of appropriate graduate seminars) before taking the qualifying exam and advancing to candidacy.

By the end of the third year, students entering with a B.A. or B.S. only must hand in a paper that would be suitable, in length and in quality, for submission to a refereed scientific journal. The paper must be handed in and approved by the main adviser no later than a month before the qualifying exam."

Prior to taking the qualifying examination, all students must prepare a preliminary dissertation prospectus of between five and 10 pages for their exam committee.

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*Course designation varies according to instructor and content. For more information, contact the undergraduate adviser.

**Students who do not hand in satisfactory papers can be terminated from the program and awarded terminal M.A. degrees.

The qualifying exam (the "oral") must be taken by the end of the third year, although it is recommended that students entering with a master's degree take it by the end of their second year. The exam is based on a discussion of three broad geographic fields built around bibliographies produced in consultation with the examining committee. Before starting dissertation research, each student must have a dissertation prospectus meet—during which the student discusses a written research proposal—with at least two members of the Exam Committee. The Ph.D. dissertation is written under the supervision of a committee of three University faculty members, one of whom must be from outside the Department of Geography and a member of the Berkeley Academic Senate. Upon final acceptance of the dissertation, the degree of Ph.D. is awarded. Students are expected to complete the Ph.D. by the end of their sixth year in the program.

### Lower Division Courses

1. **Global Environmental Change.** (4) Three hours of lecture and two hours of laboratory per week. The global pattern of climate, landforms, vegetation, and soils. The relative importance of natural and human-induced change, global warming, forest clearance, accelerated soil erosion, glacial/postglacial climate change, and biological and cultural adaptation.

2. **World Regions, Peoples, and States.** (4) Three hours of lecture and one hour of discussion per week. This course will provide a framework for recognizing and analyzing the major distinctive regions of the world in comparative context. The most important interrelations between environment, economy, ethnicity, and identity and viability of states will be explored. Sayre

3. **Globalization.** (4) Three hours of lecture and one hour of discussion per week. How and why are geographical patterns of employment, production, and consumption unstable in the contemporary world? What are the consequences of NAFTA, an expanded European Community, and postcolonial migration flows? How is global restructuring culturally reworked locally and nationally?

4. **Freshman Seminar.** (1) Course may be repeated for credit. Sections 1-3 to be graded on a letter grade basis. Sections 4-6 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen.

5. **The Ocean World.** (4) Three hours of lecture and one hour of discussion per week. Introduction to the cultural and physical geography of the world's oceans. Ecology of ocean biota and environments. History and geography of ocean peoples, cultures, and resource use. Problems confronting ocean peoples and environments. New approaches to saving the oceans. (F,SP)

6. **Justice, Nature, and the Geographies of Identity.** (4) Three hours of lecture and one hour of discussion per week. The intersection of nature, identity, and politics. The pages of newspapers almost every day from stories of toxic waste sites, crime, genetic engineering, indigenous struggles, and terrorist tendencies. In all these and many other cases, ideas of race, class, and gender intersect with ideas of nature and geography in often tenacious and troubling ways. Our approach will be to understand these traditional ideas of environmental justice as well as to examine less traditional sites of environmental justice such as the laboratory, the war zone, the urban mall, and the courtroom. (F) Kosek

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*Students who do not pass the qualifying exam can be terminated from the program and awarded terminal M.A. degrees.*
35. Global Ecology and Development. (4) Three hours of lecture and one hour of discussion per week. Problems of Third World poverty and development have come to be seen as inseparable from environmental health and sustainability. The course explores the global impact of human actions, especially the transformation of nature, the space of cities, and some major themes in geography, such as regional differences, sustainability, and human rights. Also listed as Development Studies C10. (F) Watts

39. Freshman Seminar. Course may be repeated for credit. (F) Three hours of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Consent of instructor and intensive reading and discussion seminar for freshmen.

40. Introduction to Earth System Science. (4) Three hours of lecture and two hours of laboratory per week. The goals of this introductory Earth system science course are to achieve a scientific understanding of impacts of human activity on global environmental change and to learn how to analyze a complex system using scientific methods. Earth system science is an interdisciplinary field that describes the cycling of energy and matter between the different spheres (atmosphere, hydrosphere, biosphere, cryosphere, and lithosphere) of the earth system. In addition to the themes of climate change, stratospheric ozone depletion, and biodiversity loss, we also discuss air and water pollution, fisheries depletion, and science in public policy. (F,SP) Chiang, Cutliff, Rhew

50AC. California. (4) Three hours of lecture and one hour of discussion per week. Formerly 150AC. California had been called "the great exception" and "America, only more so." Yet few of us pay attention to its distinctive traits and to its effects beyond our borders. California may be "a state of mind," but it is also the engine of change in the global environment. Just how different is this place, and what are the implications for the future? The role of agriculture in the world economy, national welfare policies and disposal of wastes on the global stage. Also listed as Earth and Planetary Science C181. (F) Bishop, Rhew

52. Introduction to Oceans. (2) Two hours of lecture per week. The geology, physics, chemistry, and biology of the world's oceans. The application of oceanography to natural and social problems will be explored through special topics such as energy from the sea, marine pollution, food from the sea, and climate change. Also listed as Integrative Biology C82 and Earth and Planetary Science C82. (F) Bishop, Rhew

98. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of group study (or fieldwork) per week. Must be taken on a passed/not passed basis. Lectures and small group discussion focusing on individual and shared interest that vary from semester to semester. Staff

Upper Division Courses

109. Prehistoric Agriculture. (4) Three hours of lecture per week. Agricultural origins and dispersals in the light of recent biological and archaeological evidence. Byrne

110. Economic Geography of the Industrial World. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 20 or prior courses in economic or regional development strongly suggested. Industrialization, urbanization, and economic growth in the global North. Locational patterns in manufacturing, retailing, and finance are examined. Geographical dynamics of technical change, employment, business organization, resource use, and divisions of labor. Property, labor, and social conflict as geographic forces. Location, national, and continental rivalries in a global economy, and challenges to U.S. dominance. (F,SP) Walker

110C. Economic Geography of the Industrial World. (4) Students will receive no credit for C110 after taking 110 or Interdisciplinary Studies 100A. Three hours of lecture and one hour of discussion per week. Prerequisites: 20 or prior courses in economic or regional development strongly suggested. Industrialization, urbanization, and economic growth in the global North. Locational patterns in manufacturing, retailing trade, and finance. Geographic dynamics of technical change, employment, business organization, resource use, and divisions of labor. Property, labor, and social conflict as geographic forces. Location, national, and continental rivalries in a global economy, and challenges to U.S. dominance. Also listed as Interdisciplinary Studies Field Maj C101. Walker

111. Local and Regional Transformation. (4) Three hours of lecture per week. The simultaneous transformations occurring in China, Japan, and Korea lead to important contributions to understanding the interconnections between forces at play in different parts of the world. The course will outline the history, languages, ethnicities, religions, and geography of the region and acquaint students with the historical foundations of some of the political, social, and economic challenges for contemporary post-Soviet Central Asian republics. Also listed as Near Eastern Studies C26.

70AC. The Urban Experience. (3) Three hours of lecture per week. The historical place of the American city. We’ll look at the economics of city life, at the organization of metropolitan political power, and at the aesthetics of the urban scene to see how the core cultural themes of American urban life have endured over time while continuously adjusting to new circumstances. Our approach is to focus on major themes in urban life and to show how various groups have had different kinds of experiences in these urban realms. This course satisfies the American Cultures requirement. (F,SP) Johns

C82. Introduction to Oceans. (2) Two hours of lecture per week. The geology, physics, chemistry, and biology of the world's oceans. The application of oceanography to natural and social problems will be explored through special topics such as energy from the sea, marine pollution, food from the sea, and climate change. Also listed as Integrative Biology C82 and Earth and Planetary Science C82. (F) Bishop, Rhew


C139. Atmospheric Physics and Dynamics. (3) Three hours of lecture/discussion per week. Prerequisites: Mathematics 53, 54; Physics 7A-7B-7C. This course examines the processes that determine the structure and circulation of the Earth's atmosphere. The approach is deductive rather than descriptive: to figure out the properties and behavior of the Earth's atmosphere we will begin based on the laws of physics and fluid dynamics. Topics will include interaction between radiation and atmospheric composition; the role of water in the energy and radiation balance; governing equations for atmospheric motion, mass conservation, and thermodynamic cycles; dynamical and quasigeostrophic motion, baroclinic instability and dynamics of extratropical cyclones. Also listed as Earth and Planetary Science C181. Chiang, Fung
The tectonics... and paleontologic characteristics of marine sediments, past climate changes throughout Earth's history, with two hours of discussion per week. Earth's climatic modifications, which are often unintentional.

C141. Paleoclimatology. (4) Three hours of lecture and two hours of discussion per week. This course examines how various components of the climate system—oceans, ice caps, and cryosphere—in concert to determine its observed state. Covered topics: observations of the climate system; the earth's energy balance; atmospheric radiative transfer; the surface energy balance; the hydrologic cycle; atmospheric circulation and its relation to the energy balance; the role of the ocean and the cryosphere. Additional topics, as time permits, will cover climate models, paleoclimate and anthropogenic; and computer modeling of climate.

Chiang

C143. Global Change Biogeochemistry. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A-1B or equivalent. The field of biogeochemistry offers an interdisciplinary approach to modern global environmental issues, such as climate change feedback effects, stratospheric ozone layer, oxidation capacity of the atmosphere, land use change, and marine ecosystem health. Earth is a complex system, and the transformation and flow of chemicals and energy within and between biomes has ramifications for life on this planet. The overall theme of this course will be to explore the imprint of humans on the chemistry of the ocean, land, and atmosphere. This course will explore the biogeochemical cycles of terrestrial, freshwater, and marine biomes. In addition, the global cycles of carbon and nitrogen are important and gases will be explored.

Rhen

C144. Principles of Meteorology. (3) Three hours of lecture per week. Weather development in relation to different scales of atmospheric circulation including analysis and forecasting with examples from the North-eastern Pacific-Western North American area.

C145. Geological Oceanography. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Upper division standing. The tectonics and morphology of the sea floor, the geologic processes in the deep and shelf seas, and the climatic record contained in deep-sea sediments. The course will cover sources and composition of marine sediments, sea-level change, ocean circulation, paleoenvironmental reconstruction using fossils, imprint of climatic records in deep-sea sediments, marine paleography, and ocean floor resources. Also listed as Earth and Planetary Science C146. Ingram

C146. Communicating Ocean Science. (4) Two and one-half hours of lecture, one hour of discussion, and two and one-half hours of fieldwork per week. Prerequisites: One course in introductory biology, geology, chemistry, physics, or marine science required and interest in ocean science; junior, senior; consent of instructor required. For undergraduates interested in improving their ability to communicate their scientific knowledge by teaching ocean science in elementary schools or science centers/aquariums. The course will combine instruction in inquiry-based teaching methods and learning pedagogy with six weeks of supervised teaching experience in a local school classroom or the Lawrence Hall of Science with a partner. Thus, students will practice ocean science knowledge and receive mentorship on how to improve their presentations. Also listed as Earth and Planetary Science C100 and Integrative Biology C100. (SP) Ingram

148. Biogeography. (4) Three hours of lecture per week. Prerequisites: 1 or lower division course in oceanography and paleontology. The biogeography of major taxa of plants and animals is on a variety of spatial and temporal scales. The effects of "continental drift," Pleistocene climatic change, agricultural origins and distributions. The ecology of invasions and extinctions. Island biogeography. Byrne

C150. California. (4) Three hours of lecture per week. California, land of contrasts, land of diversity: economic, human, physical. The extraordinary achievements of the state's industry, agriculture, and culture. The surprising contours of its cities, countryside, and landscapes. The high costs of its rampant history of urbanization, resource extraction, and human exploitation. (F,SP)

C152. Multicultural Europe. (4) Three hours of lecture per week. A vehicle for instructors to address contemporary Europe in the areas of culture, society, and politics. In particular, we will look at the effects of mass migration due to globalization processes—on the national culture of the core countries and examine the ways in which particular national cultures react to the increasing multiculturalization of Europe. The goal of the course is, first of all, to familiarize students with a variety of cultural, social, and political innovations that accompany the formation of multicultural Europe. This involves: (1) an examination of the traditional and the contemporary European culture; (2) a study of the Europeanization of culture. Also listed as History C176, Interdisciplinary Studies Field Maj C145, and International and Area Studies C145.

C157. Central American Peoples and Cultures. (4) Three hours of lecture per week. A comparative survey of the peoples and cultures of the seven countries of the Central American Isthmus from a historical and contemporary perspective. Also listed as Chicano Studies C161. Marsh

159AC. The Southern Border. (4) Four hours of lecture/discussion per week. The southern border—from California to Florida—is the longest physical divide between the First and Third Worlds. This course will examine the border as a distinct landscape where North-South relations take on a specific spatial and cultural dimension, and as a region which has been the testing ground for such issues as free trade, immigration, and ethnic politics. Also listed as Education 186AC and Ethnic Studies 159AC. This course satisfies the American Cultures requirement. Marsh, Shaken

C160A. American Cultural Landscapes, 1600 to 1900. (4) Three hours of lecture and one hour of discussion per week. Introduces ways of seeing and interpreting historical landscapes and cultures, as revealed in everyday built surroundings—houses, highways, farms, factories, stores, recreation areas, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations and to speculate for themselves about cultural meaning. Also listed as American Studies C112B and Environmental Design C169A. (F) Groth

C160B. American Cultural Landscapes, 1900 to Present. (4) Three hours of lecture and one hour of discussion per week. Introduces ways of seeing and interpreting American histories and cultures, as revealed in everyday built surroundings—homes, highways, family, small towns, city districts, and regions. Encourages students to read landscapes as records of past and present social relations, and to speculate for themselves about cultural meaning. Also listed as American Studies C112B and Environmental Design C169B. (SP) Groth
and scale of human transformation of nature have graphical inquiry and has gained urgency as the rate and natural environments lies at the heart of geo-

199. Supervised Independent Study. (1-4;4) (F,SP)

H195A-H195B. Honors Course, (1-4;1-4) Course may be repeated for credit. Hours to be arranged.

Prerequisites: Admission to Honors Program. Required for honors in geography. Students will write a thesis. One or two semesters, credit and grade to be awarded upon completion of the sequence. (F,SP)

197. Field Study in Geography. (1-4) Course may be repeated for credit. Regular individual meetings with faculty sponsor. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Supervised experience in application of geography in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4;4) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP)

199. Supervised Independent Study. (1-4;4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Senior standing. Overall GPA in major of 3.00. (F,SP)

Graduate Courses

200A-200B. Contemporary Geographic Thought. (4;4) Three hours of seminar per week. Prerequisites: Required of all first year graduate students. The class has as its goal to lead students to understand several aspects basis upon which to judge arguments. A second is to help students see, think, and write geographically — that is, to interpret the making and meaning of our physical landscapes. A third goal is to introduce students to the tremendous range of geographical inquiry and what is probably the major strength of geography as a form of thought: to wit, making links across space, among peoples, and between earth and the human. Sequence begins in the fall.

203. Nature and Culture: Social Theory, Social Practice, and the Environment. (4) Three hours of seminar per week. The relationship between societies and their environments lies at the heart of geo-

204. Introduction to Field and Laboratory Methods in Earth Systems in the Graduate Program. (1-7) Course may be repeated for credit with consent of instructor. Three hours of lecture per week, plus weekly laboratory visits or field trips. Earth system science is an interdisci-

242. Glaciology. (4) Three hours of lecture and one hour of consultation per week. Prerequisites: Calculus. A review of the mechanics of glacial systems, includ-

243. Advances in Studies of Environmental Change. (4) Course may be repeated for credit. Three hours of seminar plus one hour of consultation per week. This course will consist of review and discussion of recently published advances in environmental change research, with an emphasis on important advances that are either: (1) concerned with spatial phenomena, whether at a watershed scale or plane-

245. Topics in Biogeochemistry. (4) Course may be repeated for credit. Three hours of seminar and one hour of consultation per week. Topics for discus-

246. Geomorphology of California. (4) Course may be repeated for credit. Seminar. Two major field trips of four days duration, each with 12-hour days. Prerequisites: Graduate standing in geography or and planet science and consent of instructor. Undergraduates need consent of instructor and 140A-140B or 140B and Earth and Planetary Science 117. Numerous tectonic and Earth surface processes act in concert to produce the physical landscapes of our planet. This course examines three major regions of California—the Sierra Nevada, the Basin and Range, and the Southern Coast Ranges—as specific case studies to demonstrate how landscapes can be understood using concepts from tectonics, geomor-

244. Introduction to Field and Laboratory Meth-

250. Seminar in Sociology of Forest and Wild-

252. Topics in Economic Geography. (4) Course may be repeated for credit. Three hours of seminar per week. Research seminar on selected topics in economic geography. Staff

253. Topics in Urban Geography. (4) Course may be repeated for credit. Two hours of seminar and one hour of consultation per week. Research seminar on selected topics in urban geography. Groth, Walker

255. Topics in Political Geography. (4) Course may be repeated for credit. Two hours of seminar and one hour of consultation per week. Research seminar on selected topics in political geography. Hart

260. Topics in Biogeochemistry. (4) Course may be repeated for credit. Two hours of seminar and one hour of consultation per week. Research seminar on selected topics in biogeochemistry. Chiang

262. Advanced Field Study in Geography. (3-7) Course may be repeated for credit. One hour of lecture and 11 hours of fieldwork per week. Each day Saturday. Additional unit requires four hours of field work per week. Extended field project required.
mentoring on how to improve their presentations. Also listed as Earth and Planetary Science C301 and Integrative Biology C215. (SP) Ingram

C302. Effective Scientific Communication. (3) Two hours of seminar per week. This course will introduce students to organizing and delivering oral presentations, initiating and organizing manuscripts, and utilizing digital communication methods, such as web-based media. Students will develop effective communication techniques through in-class experience. This class will have an emphasis on the sciences but will be useful and open to graduate students of all disciplines. Also listed as Environ Sci, Policy, and Management C302. (F) Resh, Rhew

German

(College of Letters and Science)

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Chair: Nikolaus Largier, Ph.D.

Professors
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Claire J. Kramsch, Agregation d’Alsace, Sorbonne
Winfried Kudszus, Ph.D. University of California, Berkeley
Niklaus Largier, Ph.D. University of Zurich
Immanuel Rauh, Ph.D. University of Michigan
Thomas F. Shannon, Ph.D. University of Washington
Elaine C. Tennant, Ph.D. Harvard University
Bluma Goldstein (Emeritus), Ph.D.
Gerd Hillen (Emeritus), Ph.D.
Joseph Miejs (Emeritus), Ph.D.
Hinrich C. Seeba (Emeritus), Ph.D.
Johan P. Snapper (Queen Beatrix Professor Emeritus), Ph.D.
Frederic C. Tubach (Emeritus), Ph.D.

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Chen Teng, Ph.D. Columbia University

Lecturer
Nikolaus Euba, M.A. Ludwig Maximilian University, Munich

Affiliated Faculty
Margaret L. Anderson, Ph.D. (History)
Judith Butler, Ph.D. (Rhetoric)
Pheng Cheah, Ph.D. (Rhetoric)
David Cohen, Ph.D. (Rhetoric)
John Connolly, Ph.D. (History)
Hubert L. Dreyfus, Ph.D. (Philosophy)
John Ellon, Ph.D. (History)
Barry Ettling, Ph.D. (Economics)
Hannah Ginsborg, Ph.D. (History)
Mel Gordon, Ph.D. (Theater, Dance, and Performance Studies)
Gary B. Holland, Ph.D. (Linguistics)
Martin Jay, Ph.D. (History)
John Liddow, Ph.D. (Comparative Literature)
Linda Rugg, Ph.D. (Scandinavian)
Mark Sandstrom, Ph.D. (Scandinavian)
Karin Sanders; Cand. Mag. (Scandinavian)
Kaja Silverman, Ph.D. (Rhetoric and Film)
Hans Sluga, Ph.D. (Philosophy)
D. Paul Thomas, Ph.D. (Political Science)
Thomas Brady (Emeritus), Ph.D.
Richard M. Buchta (Emeritus), Ph.D.
Carol J. Glover (Emeritus), Ph.D.
Gerald Feldman (Emeritus), Ph.D.
Ernst B. Haas (Emeritus), Ph.D.
Daniel Heartz (Emeritus), Ph.D.
Alan Nelson (Emeritus), Ph.D.
Anthony Neuwirth (Emeritus), Ph.D.

Professional Courses

301. Professional Training: Teaching Practice. (1-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis.

C301. Communicating Ocean Science. (4) Two and one-half hours of lecture, one hour of discussion, and two hours of fieldwork per week. Prerequisites: One course in introductory biology, geology, chemistry, physics, or marine science required and interest in ocean science; junior, senior, or graduate standing; consent of instructor required for sophomores. For graduate students, this course prepares them to be effective communicators. For undergraduates, this course provides an introduction to the scientific disciplines involved in marine biology. Prerequisites: Oceanography 1 or equivalent. (SP) Blum, W., Ingram, C., and Resh, N. P.

Department Overview

The Department of German offers undergraduate and graduate students the opportunity to obtain a broad background in the field of German language, literature, and culture, and introduces them to the principles of literary analysis and criticism. German language instruction ranges from elementary courses to advanced courses in German style. Upper division courses cover German literature and culture from the earliest times to the present, as well as the linguistic study of German. The graduate program in literature and culture emphasizes seminars that provide an in-depth study of more specialized areas. The graduate offerings in linguistics constitute a complete program of study in Germanic languages. Instruction in methodology is provided for graduate student instructors and prospective teachers, and seminars applied linguistics and second-language acquisition provide a theoretical and practical foundation for teachers.

The curriculum in Dutch studies focuses on the languages, literature, and culture of the Netherlands and Flanders.

The Major

Lower Division. German 1, 2, 3, 4, or the equivalent.

Upper Division. Ten upper division courses total- ing at least 30 units; at least five courses and 15 units must be taken at Berkeley. The following courses are required: German 100, 101, and 102. Three additional courses in which a knowledge of German is required, as indicated in the course descriptions that follow or in the department booklet; German 100 or 101 is prerequisite for these courses. Two courses may be taken from a list of affiliated courses taught outside the Department of German. (The list is available in the Department of German.) Courses must be taken in the literature and culture of at least two different centuries; consult the major adviser or undergraduate studies faculty officer when in doubt about this requirement.

Transfer Students. If you are transferring from another institution and wish to declare a major in German, see the major adviser or the undergraduate student affairs officer.

Honors Program. A GPA of 3.5 in the major and an overall GPA of 3.3 are required for participation in the program during the senior year.

Course requirement: Four units in the 100-99 series (H191RA and H196B or H196S) and an honors thesis. The honors committee, consisting of the major adviser and the thesis director, approves the topic and evaluates the thesis.

The Minor

Lower Division. German 1, 2, 3, 4, or their equivalent.

Upper Division. Five courses (of which three must be taken at Berkeley). Students must enroll in at least five upper division courses in which the knowledge of German is required (see the course descriptions that follow or the department booklet for current information). One affiliated course from another department or a course in Dutch or Yiddish from the Department of German may be applied to the minor.

A letter grade of C or better is required for each upper division course applied to the minor.

Graduate Programs

The M.A. Program. A Bachelor of Arts degree (or its equivalent) in German or a related field is required for admission to either the literature and culture option or the linguistics option.

Literature and culture option: Students are not admitted solely to pursue the M.A., which is an integral part of the Ph.D. program. Students must complete 24 units, 12 of which must be in graduate courses in the Department of German. An examination, involving interpretation of a literary text, is normally taken at the end of the third semester.

Linguistics option: The program offers a broad range of courses in contemporary and historical language and the methods of German and Germanic linguistics, including recent directions in such areas as discourse grammar, linguistic field work, and semantics. Students must complete at least 37 units, 28 of which must be in graduate courses. A knowledge of Middle High German
as well as proficiency in oral and written New High German is required. Students are granted the degree upon passing a written examination.

For more detailed information on the M.A. program in literature and linguistics, students should visit the department website at ger@berkeley.edu.

The Ph.D. Program. The Department of German offers Ph.D.s in German and Germanic linguistics and in German literature and culture. The program aims at a comprehensive historical knowledge of German literature and culture and/or linguistics and is designed to encourage students to develop intellectual independence and creative initiative.

Doctor of Philosophy: Literature and Culture. The department offers an interdisciplinary program with a wide array of approaches to literature and culture. Candidates for the Ph.D. in German literature and culture should have advanced cultural competence in German; a thorough knowledge of, and sound judgment in, German literature, culture, and intra-cultural history; an understanding of various critical perspectives on literature and culture; and the ability to pursue original research and to argue their ideas convincingly both in English and in German. Students achieve a broad historical overview of German literature and culture; develop cultural competence and teaching proficiency; become familiar with differing approaches to literary, cultural, and linguistic study; and enhance research skills. Permission to proceed in the Ph.D. program is granted if the M.A. examination taken in the third semester shows evidence of satisfactory progress. By the eighth semester, the student is examined in the qualifying examination, which determines the student's ability to embark on the dissertation project. The capacity for original thinking, the ability to conceptualize problems, expand disciplinary horizons, and a beginning familiarity with the workings of the profession are goals at this level. Students must also acquire competence in an outside field complementing the German language and literature; students will continue to develop communicative competence in both spoken and written language while being sensitized to the links between language and culture. This course covers the same material as 1 in a condensed way and at an accelerated speed. Upon completion of this course, students will qualify for enrollment in 2.

German

Lower Division Courses

1. Elementary German 1. (5) Five hours of lecture per week. Prerequisites: Prior knowledge of German is required. Students who have attended a German language course and those who are required to take the placement test will be evaluated on their knowledge of German. (F,SP) Euba

2. Elementary German 2. (5) Five hours of lecture per week. Prerequisites: 1 or equivalent. In this course, students will continue to develop communicative competence in the German language and expand their sensitivity towards the relationship between language and culture. While all language skills will be addressed, additional emphasis will be on the various styles of written and spoken German. (F,SP) Staff

3. Intermediate German I. (5) Five hours of lecture per week. Prerequisites: 2 or equivalent. While continuing to expand students' communicative competence in German, this content-driven course will provide insights into postwar German history and cultural trends. It is important to focus on the development of language skills (critical reading and writing, vocabulary expansion, theoretical and cultural concepts). You will be guided towards expressing yourself on more abstract topics, such as language and power in society, multiculturalism, rebellion and protest, and social changes. A drawing connection between texts and contexts, using a variety of text genres (journalistic, historical, short story, poetry, drama, advertising, film). (F,SP) Euba

4. Intermediate German II. (5) Five hours of lecture per week. Prerequisites: 3 or equivalent. In this fourth-semester German language course, students will work on strengthening their interpretive abilities as well as their writing and oral forms of expression. While continuing the development of communicative competence and fluency, we will discuss the links between language and culture and develop the skills necessary for working independently. Students will examine numerous issues and questions central to defining the complexity of modern German culture. (F,SP) Euba

RSA-RSB. Reading and Composition. (4-4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing requirement or UC Analytical Writing Placement Exam for SA. Any A-level course for 5B. Formerly 4 and 10. This course includes a study of modern German literary, cultural, and intellectual currents, as well as an introduction to argumentation and analysis. Students will examine numerous issues and questions central to defining the complexity of modern German culture. RSA satisfies the first half of the Reading and Composition requirement, and RSB satisfies the second half. (F,SP) Staff

10. Elementary German Workshop. (10) Ten hours of lecture/lab/oratory per week. This accelerated elementary course is conducted entirely in German. All four language skills (reading, listening, speaking, and reading) and knowledge of the German language while being sensitized to the links between language and culture. This course covers the same material as 1 in a condensed way and at an accelerated speed. Upon completion of this course, students will qualify for enrollment in 2.

20. Intermediate German Workshop. (10) Ten hours of lecture/oratory per week. Prerequisites: Prior knowledge to German equivalent to one year of high school German. Students review and continue to develop the basic elements of communicative competence in the German language while being sensitized to the links between language and culture. This course covers the same material as 1 in a condensed way and at an accelerated speed. Upon completion of this course, students will qualify for enrollment in 2.
102A. Advanced Language Practice: German Performance. (3) Three hours of lecture per week. Prerequisites: 4 or equivalent, or consent of instructor. Formerly 188. Analysis, discussion, adaptation, and public performance of authentic texts from Germany. Kabarett, such as comedic skits, political and social satire, parody, humorous poetry. Text selection will vary each semester. (F,SP) Euba

102B. Advanced Language Practice: German for Business. (3) Three hours of lecture per week. Prerequisites: Open to native speakers. Formerly 103. This advanced language/culture course focuses on the structure and practices of German business as well as current economic, political, and cultural contexts and will focus on business writing, presentations, and negotiation. (F,SP) Toth

102C. Advanced Language Practice: German for Information Technology and Science. (3) Three hours of lecture per week. The course is designed to help those in the sciences to become acquainted with the linguistic registers and structures that inform German scientific texts. It will also serve as an introduction for students of German to the world of science, which German-speaking scientists have helped create and expand. We will move through a number of the major specific disciplines, developing the tools for vocabulary acquisition. Each student will be better able to concentrate within their speciality in order to read, write, and speak within that discipline with a high degree of accuracy and clarity. (F,SP) Clarke

102D. Advanced Language Practice: Popular Culture in Germany. (3) Three hours of lecture per week. Focusing on popular culture in German speaking countries, this advanced level language course will help students to improve and expand on spoken and written language functions utilizing a variety of works from different genres in journalism, broadcasting, literature, fine arts, and the cinema. The final goal is to enable students to participate in the academic discourse—written and spoken—at a linguistic and stylistic level appropriate for an advanced student of German in upper division courses. (F,SP) Euba

105. Middle High German for Undergraduates. (3) Open to graduate students when 203 is not offered. Three hours of lecture/translation/discussion per week. Prerequisites: Knowledge of modern German required. Students will learn the fundamentals of Middle High German grammar and will read selections from major narrative works of the High Middle Ages. Selections from major works from the 13th century. (F) Tang

108. Literary Translation. (3) Three hours of lecture per week. Prerequisites: Upper division courses in German literature. This course introduces students to the problems of literary translation from German to English. (SP) Kudszus

109. Language and Power. (4) Three hours of lecture and one hour of discussion per week. Formerly 109. Multidisciplinary explorations into the origins, nature, and exercise of language as social symbolic power, drawing on readings taken from anthropology, social and cultural theory, and critical discourse analysis. Topics include language and myth, the meaning of power, the economy of verbal exchanges, and the power of language in institutional discourse, gender and discourse, and linguistic imperialism. Also listed as Letters and Science C180T. Kramsch

110. The Literature of the Middle Ages. (3) Three hours of lecture/discussion per week. Prerequisites: Two upper division courses in German literature. This course introduces students to the problems of literary translation from German to English. (SP) Kudszus

111. Introduction to German Linguistics. (3) Three hours of lecture per week. This course is designed to provide students with an overview of the major subfields of linguistics as they apply to the German language. It also serves as the gateway course for the further study of linguistics at the undergraduate level. The first part of the course will focus on the synchronic description of contemporary German. The second part of the course will concern itself with variation in German. There are no prerequisites for this class and no prior experience with linguistics is presupposed. However, an advanced knowledge of German (at least German 4 level) is expected. (SP) Shannoff

114. Senior Colloquium. (3) Three hours of lecture per week. Prerequisites: 102 or consent of instructor. Returnees from EAP Goettingen welcome. This course is intended for students who wish to improve their skills in reading, speaking, and writing German. We will work with texts that were influential in Germany during the first decades of the 20th century, regardless of when they were written. Segments of philosophical writings (Schopenhauer, Kierkegaard, Nietzsche), literary works (George, Rilke, Th. Mann), but also texts by scientists and journalists will be analyzed. Participants are expected to prepare several oral presentations and approximately one written assignment per week. No midterm or final examination. (F,SP) Hillen

131. Goethe. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. An introduction to Goethe’s prose, drama, and poetry. (F,SP) Staff

140. Romanticism. (3) Three hours of lecture/discussion per week. Prerequisites: Knowledge of German required. An introduction to the Romantic period. (F)

147. German Drama and Opera. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. This course introduces students to the masterpieces of German opera from the 18th to the 20th century. (F) Tang

148. Topics in Narrative. (3) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Analysis of German narrative forms. Topic varies. (F,SP) Staff

157A. Luther, Kant, Hegel. (4) Introduction to the intellectual history of Germany from the age of the Reformers to the period of Idealism. We will focus on three major thinkers—Martin Luther, Immanuel Kant, and G.W.F. Hegel—on key issues in their thought, and on the reception and discussion of some of these issues in 20th century theory. Lectures and readings in English. (F,SP) Staff

157B. Marx, Nietzsche, Freud. (4) Formerly 157. The aim of the course is to explore the central theoretical and philosophical premises of three of the most influential thinkers in the German-speaking world and to examine in detail several works in which problems of history, ideology, values, and methodology are considered. Lecture and readings in English. Also listed as Letters and Science C140T. (F,SP) Holub

157C. Heidegger and Arendt. (4) This course is an introduction to the work of Martin Heidegger and Hannah Arendt. We will begin by investigating into Heidegger’s conceptualizations of time, language, and human dwelling. We will then move to an examination of Arendt’s political philosophy, including her focus on the public/private distinction. Taught in English. (F,SP) Staff

157D. Adorno, Benjamin, Habermas. (4) This course examines the writings of the Frankfurt School of Critical Theory, a major branch of western Marxism. Focusing on confrontations with modernity, the course explores three seminal thinkers: Walter Benjamin, known for his genial insights into the culture of modernism; Theodor Adorno, the versatile philosopher and aesthetic theorist of the avant garde; and
160. Politics and Culture in 20th-Century Germany. Three hours of lecture/discussion per week; plus additional film screenings. Lectures and readings in English. (F,SP) Staff

160A. A Century of Extremes. (4) Formerly 150. The story of Germany in the 20th century is a dramatic one, comprising two world wars, genocide, Allied occupation, a division into two states on opposing sides of the Cold War, and finally an unexpected unification. This course offers an introduction to the history and culture of contemporary Germany. It aims at a systematic account of German history in the 20th century as a basis to understand some of the current cultural, economic, and political challenges Germany faces today. (F) Kudzus

168. Yiddish Literature and Culture in Translation. (3) Course may be repeated for credit with different topic. Three hours of lecture per week. Introduction to the development of Yiddish literature from the start of the Yiddish language in the early 16th century to Yiddish literature today. The course will touch upon the rich history of Yiddish-speaking communities in Europe, the global flourishing of the language of Ashkenazi Jews from the mid-19th century until the Nazi genocide and its aftermath. Works include a wide range of fiction, essays, poetry, autobiography, music, and theatrical and film performance. (SP) Staff

170. History of the German Language. (3) Three hours of lecture/discussion per week. Designed for undergraduate and graduate students interested in the history of the language of the newly united Germany, which transcribes a rich linguistic legacy from the Lay of Hildebrand, through Luther and Grimm, to Grass and Der Spiegel. Discussion, via linguistic principles, of language processes in the genetic development of the German language, as well as its interrelationship with closely related languages such as English and Russian. (F) Rauch

172. German Dialects. (3) Two hours of seminar per week. Formerly 295. This course examines geographically and historically different dialects and varieties of the German language. Among other things we will consider the differences between language and dialect, the division of German dialects and the history of German dialect study, various linguistic features (phonological, morphological, syntactical, lexical) characteristic of the major German dialect areas, and issues involving the use of dialect versus standard language in contemporary society. Besides regular readings and written assignments, grades will be based on active participation and a paper or exam. (F) Shannon

173. The Phonetics and Phonology of Modern German. (3) Students will receive no credit for 173 after taking 103 before Spring 2002. Three hours of lecture/discussion per week. A course designed for undergraduates and graduates on the structure of modern German covering the fundamentals of German phonetics and phonology, with comparison to English. Students should have previous knowledge of German dialect phonology. (F,SP) Shannon

174. The Morphology and Syntax of Modern German. (3) Three hours of lecture/discussion per week. A course designed for undergraduates and graduates on the grammatical structure of modern German, which transcribes a rich linguistic legacy from the Lay of Hildebrand, through Luther and Grimm, to Grass and Der Spiegel. Discussion, via linguistic principles, of language processes in the genetic development of the German language, as well as its interrelationship with closely related languages such as English and Russian. (F,SP) Rauch

175. 20th-Century Poetry. (3) Analysis of various poetry from the beginning of the century to today, including works by Trakl, Benn, Bachmann, Sachs, Celan, and Brinkmann. A 20-page research paper will be part of the requirements for this course. Kudzus

176. German Cultural History in a European Context. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Course will be taught in English. Topics of the course will change from semester to semester. It will examine major topics, concepts, and theories pertaining to the cultural identity of western Europe, selected around a specific geographical and historical area. The focus will be on how processes of internationalization in film production and distribution intersect with the projection of a transnational global imagery. Some examples of transnational cinematic connections will be analyzed in historical perspective as well as contemporary examples of “migrant cinema.” We will investigate how these films engage with debates about multiculturalism and assimilation/segregation of minorities, as scenarios of mobility and mobility are often intertwined with representations of ethnicity and gender. (F,SP) Gokturk

182. German Cinema in Exile. (4) The course will deal with the topic from various angles; a representative selection of American films from the United States and some films from the Weimar Republic will be shown and discussed in terms of their visuals and narratives. There will also be literary texts and cultural documents (articles on crime in the United States, on working conditions in Hollywood) pertaining to the topic. Films have English subtitles. (SP) Kaes

186. Transnational Cinemas. (4) Three hours of lecture/discussion per week, plus weekly film screenings. This course will explore how experiences of migration, displacement, diaspora, and how processes of internationalization in film production and distribution intersect with the projection of a transnational global imagery. Some examples of transnational cinematic connections will be analyzed in historical perspective as well as contemporary examples of “migrant cinema.” We will investigate how these films engage with debates about multiculturalism and assimilation/segregation of minorities, as scenarios of mobility and mobility are often intertwined with representations of ethnicity and gender. (F,SP) Gokturk

H196. Honors Studies in German. (2-4) Prerequisites: One of the 195 courses. Supervised independent research and research projects. Students who are writing their theses for completion of the requirements for the Honors Program. (F,SP) Staff

H196A-H196B. Honors Studies in German. (2) Students will receive no credit for H196A-H196B after taking H196. Individual meetings to be arranged with advisor. Credit awarded to students who are writing their theses for completion of the requirements for the Honors Program. (F,SP) Staff

H196A. Professor of the Graduate School

H196B. Recipient of Distinguished Teaching Award
Graduate Courses in Literature

Introductory

200. Proseminar in German Literature. (2) Two hours of lecture/discussion and one hour of practical exercises per week. The course will give a brief introduction to the history of Germanistik, drawing attention to bibliographical and research tools, dwell on problems relating to critical editions of modern authors, familiarize students with German language as a living language in the United States, and focus upon literary theory. Required of all M.A. candidates. Staff

201. Major Periods in German Literature. Three hours of lecture/discussion per week. Designed expressly for M.A. candidates. Final exam, no paper.

201A. Literature of the Middle Ages. (4) Survey of medieval German literature that concentrates on monuments of the Hohenstaufen period but also includes representative works from the later 13th, 14th, and 15th centuries. Intended for M.A. candidates but open to all students with a working knowledge of Middle High German. Tennant, Largier

201B. 16th and 17th Century. (4) Recommended for M.A. candidates. (F) Tennant, Largier

201C. 18th Century. (4) An introduction to major works of late Enlightenment, Sturm and Drang, and Classicism to Schiller's death. Staff

201D. 19th Century. (4) A study of pivotal literary texts, including works by Goethe, Novalis, Holderlin, Heine, and Nietzsche. (SP) Kudszus

201E. 20th Century. (4) A critical overview of major literary and cultural developments of the 20th century, including the impact of fascism, World War II, and the final turn of the century. We will explore literary, sociocultural, and philosophical forces in their consequential interactions. Considerations will include Freud, Dada, Expressionism, National Socialism, Expressionism, Soviet post-World War II literature, experimental literature, and post-modernism. Kaeß

202. Stilistikum. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. This course is suggested as an introduction to the stylistics of critical writing and is designed for graduate students who want to improve their writing skills and their oral performance in German. Some exercises will be devoted to academic presentations. (F,SP) Raethke-Weber

203. Readings in German Philosophy. (2) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: One year reading knowledge of German. A study of German as a language of philosophical thought and discourse. The course will involve close readings of representative works from the German philosophical tradition, with special attention paid to issues of language and translation. The goal of the course is to provide students with the ability to read German philosophical texts with understanding. (SP) Staff

204. Compact Seminar. (2) Course may be repeated for credit. Two hours of seminar for four weeks. A compact seminar designed to feature distinguished short-term visitors from German-speaking countries who have expertise in German literature and culture to teach topics that complement regular department offerings. One short paper is required. Taught in German. (F,SP) Staff

Literary History

205. Studies in Medieval Literature. (4) Two hours of seminar and one hour of tutorial per week. Prerequisites: 102 or 203. (F,SP) Staff

206. Studies in the Early Modern. (4) Two hours of seminar per week. Survey of texts from the 15th and 16th centuries. A good reading knowledge of Middle High German is recommended. Tennant, Largier

270. Reading the German Literary Text. (4) Four hours of seminar per week. Reading a variety of literary texts, periods, and genres, this seminar will present and explore different ways of reading. Topics will include literary hermeneutics and textual deconstruction. (F,SP) Kaeß, Kudszus, Largier

208. Studies in the 17th Century. (4) Two hours of seminar per week. A study of a series of topics dealing with 17th century authors, genres, or themes. Whatever the topic, the high points of the century will be treated. Staff

210. Studies in the 18th Century. Two hours of seminar and one hour of tutorial per week. Staff

210A. Age of Enlightenment. (Formerly 211A.) Literary texts will be studied as historical documents illuminating changes in literary theory and in religious and philosophical thought during the Enlightenment. Texts by Lessing, Herder, and Lenz, and some Storm and Stress plays.

210C. Storm and Stress and Literary Jacobinism. (4) A comparison of the two literary movements in the late 18th century will be made in the wider context of oppositionality in literature. Wilson

212. Studies in the 19th Century. Two hours of seminar and one hour of tutorial per week. Staff

212A. Topics in Romanticism. (4) Course may be repeated for credit. Major authors and texts of the romantic period will be discussed. (F,SP) Staff

214. Studies in the 20th Century. (4) Course may be repeated for credit as topic varies. Two hours of seminar per week. Staff

Author

234. Goethe. Three hours of seminar per week.

234A. Early Goethe. (4) Concentration on the works of Goethe's Sturm und Drang period and Faust V. Various interpretations of the major works of the author will be examined in the course of research in this period. (F,SP) Weisinger

Theory

255. Interpretation and Criticism of Poetry. (4) Three hours of seminar per week. (F) Kudszus

256. Problems of Literary Theory. (4) Course may be repeated for credit. Two hours of seminar and one hour of tutorial per week. Topics vary from year to year. For current topic, see the department's "Course Descriptions" booklet. Staff

258. Linguistic Approaches in Literature. (4) Three hours of lecture per week. Introduction to basics of stylists, poetics, and literary discourse analysis. Principles of literary interpretation based on the linguistic features of texts and their reception by native and non-native readers. The readings of German literary texts of prose, poetry, and plays. Topics include deixis, face-work, focalization, indexically, intertextuality, metaphor, performative, point of view, reported speech, tense and aspect, speech act, speech genre. (F,SP)

263. Studies in Language. Three hours of seminar per week.

263A. The Process of Translating. (4) Questions of interpretation, writing and intertextuality will be explored in connection with translating a 20th-century literary work. Kudszus

282. Old Saxon. (4) Three hours of lecture/discussion per week. Study of the most characteristic of the major Old Germanic languages (broadly construed) not covered elsewhere: Old Low Franconian, Middle Dutch, Old Frisian, Middle Low German. (F,SP) Shannon

282. New Saxon. (4) Three hours of lecture/discussion per week. Study of the most characteristic of the major Old Germanic languages (broadly construed) not covered elsewhere: Old Low Franconian, Middle Dutch, Old Frisian, Middle Low German. (F,SP) Shannon

Graduate Courses in Linguistics

271. Comparative Germanic. (4) Three hours of seminar per week. Advanced topics in Germanic phonology, morphology, syntax, semantics, pragmatics. The principal Germanic dialects viewed within laryngeal theory and reconstruction. (SP) Rauch

273. Gothic. (4) Three hours of lecture/discussion per week. Study of the linguistic structures of the earliest Germanic dialect with a sizable corpus. Indo-European origins, Germanic relationships, and Gothic as a synchronic construct are considered. (F) Rauch

276. Old High German. (4) Three hours of lecture per week. Reading of poetic and prose texts in Old High German. The synchronic and diachronic study of the dialects of the High German language from the eighth to the 11th century within the framework of current linguistic method. Rauch

278. History of the Dutch Language. (4) Two hours of lecture and one hour of tutorial per week. The history, emergence, development of Dutch, and its relationship with English and German. See also Dutch 107. Shannon

280. North Sea Germanic. (4) Three hours of seminar per week. Readings and discussion of poetic and prose texts in the Ingwaeonic languages (broadly construed) not covered elsewhere: Old Low Franconian, Middle Dutch, Old Frisian, Middle Low German. (F,SP) Shannon

290. Seminar in German Linguistics. (4) Course may be repeated for credit. Two hours of seminar and one hour of tutorial per week. Variable topic. For specific topic, contact the department office.

291. Methods and Issues in German Morphology. (4) Two hours of seminar per week. The seminar will deal with the methods and results of morphological analysis as applied to the German language. It will introduce basic concepts and means of morphological analyses, as well as study and apply various theories.
Group and Individual Study

298. Directed Group Study. (2-8) Course may be repeated for credit as topic varies. Seminar. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

299. Individual Study for Graduate Students in Literature and Linguistics. (2-12) Course may be repeated for credit. Individual conference. Primarily for post-M.A. students engaged in exploration of a restricted field, involving writing of a report, and for students writing their doctoral dissertations. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated once for credit. Individual conference. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: M.A. in German. Independent study under consultation with graduate adviser to provide an opportunity for Ph.D. students to prepare for the qualifying examination. (F,SP) Staff

Courses in the Teaching of German

350. Seminar in Foreign Language Pedagogy: Teaching College German I. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. The course focuses on the theory and practice of foreign language pedagogy. It introduces students to second language acquisition research and its relationship to pedagogy, providing a basis for staying theoretically informed and for participating in professional discourse of the field throughout one’s teaching career. It also emphasizes critical reflection on pedagogical practices and how they relate to practical component dealing directly with the day-to-day challenges of teaching elementary German. (F) Staff

351. Seminar in Foreign Language Pedagogy: Teaching College German II. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. This course expands upon the basis of methodology and theory of language teaching covered in 350 and prepares students for teaching at the intermediate level of German. It includes practical and theoretical exploration of recent developments in second language teaching concentrates on instructional technology, teaching writing, teaching literary texts, and curriculum design. Students reflect on their development as teachers through a journal, video, and observation of their teaching, and the final portfolio. (SP) Staff

German

292. German Syntax. (4) Two hours of seminar per week. Discussion of current syntactic theories as applied to a number of issues in modern German syntax with an eye toward their description and explanation. Typological comparison, especially with English.

293. German Semantics. (4) Two hours of seminar per week. Concentration on the essential categories of semantics via data from German and Germanic. Extensive discussion of semantic change, the semantics of prevarication, and the semantics of pathological language.

294. Contrastive Grammars. (4) Two hours of seminar per week. Theory and methods of contrastive linguistic analyses. Study of pairs of contrastive language sets in two time perspectives: (1) Modern German with Modern English and (2) Early New High German with Early New English. Rauch

295. Dialectology. (4) Two hours of seminar per week. Discussion of modern methods and results in the investigation of present-day German dialects. (F) Shanan

296. Semiotics. (4) Two hours of seminar per week. Discussion of the principal figures from the basic disciplines of philosophy, biology, and linguistics influential in current trends in semiotics. Application of Peircean semiotics to a wide range of semiotic modalities in current trends in semiotics. Application of Peircean semiotics to a wide range of semiotic modalities in current trends in semiotics.

Yiddish

Upper Division Courses

101. Elementary Yiddish. (5) Five hours of lecture/discussion per week. Introduction to Yiddish language and literature. Attention to reading, writing, and the oral tradition in the context of the historic Yiddish cultural environment. (F)

102. Intermediate Yiddish. (5) Students will receive no credit for 2 after taking 102. Five hours of lecture/discussion per week. Prerequisites: 101 or equivalent. Further intensive study of Yiddish, building on the foundation established in 101. Advanced grammar and introduction to the reading of original texts. (SP) Staff

103. Readings in Yiddish. (3) Course may be repeated for credit when readings change. Three hours of lecture/discussion per week. Prerequisites: 101 or equivalent, or consent of instructor. Study of selected Yiddish texts including prose, poetry, and drama, from various periods and geographic areas, in the context of time and place. Review of relevant grammatical topics. Increased attention to the Hebrew/Aramaic component. Selections may vary from semester to semester. (SP) Staff

Lower Division Courses

1. Elementary Dutch. (5) Five hours of lecture and one hour of laboratory per week. Dutch language course for business majors with Modern English and (2) Early New High German with Modern English. Rauch

Courses in the Teaching of German

350. Seminar in Foreign Language Pedagogy: Teaching College German I. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. The course focuses on the theory and practice of foreign language pedagogy. It introduces students to second language acquisition research and its relationship to pedagogy, providing a basis for staying theoretically informed and for participating in professional discourse of the field throughout one’s teaching career. It also emphasizes critical reflection on pedagogical practices and how they relate to practical component dealing directly with the day-to-day challenges of teaching elementary German. (F) Staff

351. Seminar in Foreign Language Pedagogy: Teaching College German II. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. This course expands upon the basis of methodology and theory of language teaching covered in 350 and prepares students for teaching at the intermediate level of German. It includes practical and theoretical exploration of recent developments in second language teaching concentrates on instructional technology, teaching writing, teaching literary texts, and curriculum design. Students reflect on their development as teachers through a journal, video, and observation of their teaching, and the final portfolio. (SP) Staff

the major grammar will be reviewed. Written and spoken proficiency will be improved. (F,SP) Staff

125. Conversation and Composition. (4) Course may be repeated once for credit. Three hours of lecture and one hour of discussion per week. Prerequisite: 100 or consent of instructor. This course is designed to improve both the oral and written style of the student in Dutch, employing a variety of sources ranging from the newspaper to the essay to the creative forms (poetry, short story). The act of correspondence, both formal and informal, will be taught as well as the widely-varying spoken styles. (SP) Staff

140. Topics in Dutch Literature. (3) Three hours of lecture/discussion per week. Prerequisites: 2 or equivalent. This course covers a number of canonical Dutch poets and authors to the image in drawings, paintings, designs, animation, and movies. Taught in Dutch with Dutch texts. (F,SP) Staff

C164. The Indonesian Connection: Dutch Literature About the Indies in English Translation. (4) Three hours of lecture and one hour of discussion per week. Taught in Dutch with Dutch texts. (F,SP) Staff

166. Anne Frank and After: Dutch Literature of the Holocaust in English Translation. (4) Three hours of lecture and one hour of discussion per week. Taught in Dutch with Dutch texts. (F,SP) Staff

170. Dutch Culture and Society. (3) Three hours of lecture/discussion per week. The course will focus on the culture of the Low Countries during both the Netherlands and Belgium. Through reading, audiovisual materials, the Internet, guest lectures, and discussions, we will cover the major social, political, and cultural aspects of modern Dutch society (e.g., social movements, the Holocaust, by both victims and survivors. The course will focus on reading and discussion in English as well as on the representation of cultural identity, national identity, and the role of major Dutch figures. The course is organized around five larger themes: water management and environmental issues; language and education; art, literature, and culture; politics, religion, and social welfare; and the role of Dutch. (F,SP) Staff

C170. Dutch Culture and Society: Amsterdam and Berkeley in the '60s. (4) Three hours of lecture and one hour of discussion per week. This course will focus on the cultural aspects of protest- and youth cultures in two cities that were influential in the '60s: Amsterdam and Berkeley. Particular attention will be paid to how American popular culture was perceived in a European context. All readings and discussions in English. Also listed as History C194 and Sociology C1189. (F,SP) Staff

171AC. From New Amsterdam to New York: Race, Culture, and Identity in New Netherland. (4) Three hours of lecture and one hour of discussion per week. Taught in Dutch with Dutch texts. (F,SP) Staff

110. Advanced Dutch. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 2 or equivalent. Topics include expanding patterns and vocabulary acquired in 2. All courses except those marked with an asterisk meet the requirement of the major. Students may receive credit for one hour of discussion per week. Prerequisites: 2 or equivalent. This course is designed to improve both the oral and written style of the student in Dutch, employing a variety of sources ranging from the newspaper to the essay to the creative forms (poetry, short story). The act of correspondence, both formal and informal, will be taught as well as the widely-varying spoken styles. (SP) Staff

173. Dutch Post-Colonial Studies. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Selected topics in Dutch or Flemish/Belgian colonial literature and/or history.
Health and Medical Sciences Program (School of Public Health)

Program Office: 570 University Hall, (510) 642-5479 jmp.berkeley.edu
Director: Ann Stevens, M.D.
Professor: Ronald Dahl, M.D.
Associate Professor: Jodi Halpern, M.D., Ph.D.
Director and Clinical Professor: John Swartzberg, M.D.
Associate Director and Clinical Professor: Ann Stevens, M.D.
Clinical Professors: Guy Micco, M.D. Kent Olson, M.D. Alan Steinbach (Emeritus), M.D., Ph.D.
Associate Clinical Professors: Claudia Landrus, M.D., Ph.D. Karen Sokol-Gutierrez, M.D., M.P.H.
Assistant Clinical Professor: Amin Azzam, M.D., M.A.
Academic Coordinator: Kevin Mack, M.D., M.S.
Lecturers: Jennifer Breckler, Ph.D. Hana Dan-Cohen, Ph.D. Amy Garin, M.D. Sara Harley, M.D.
Associate Adjunct Professors: Colette Auerswald, M.S., M.D. Stephen Srey, Ph.D. Susan Ivey, M.D., M.H.S.A. Ndola Prata, M.D., M.Sc.
Assistant Adjunct Professor: Douglas Jutte, M.D., M.P.H.

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Adjunct Professor: Eric Stover, M.D.
Professor-in-Residence: John R. Baltes, M.D.

Program Overview

UC Berkeley-UCSF Joint Medical Program. A five-year program leading to a Master of Science degree in health and medical sciences from UC Berkeley and the medical degree of the UCSF School of Medicine. The program is a joint program of the UC Berkeley School of Public Health and the UCSF School of Medicine. The program is designed to allow students to pursue a Master of Science degree in health and medical sciences at UC Berkeley and the medical degree at UCSF.

The program requires students to complete a minimum of 90 units of academic coursework, including 30 units of required coursework and 60 units of elective coursework. The program is divided into four years: the first year is spent on coursework at UC Berkeley, the second year is spent at UCSF, and the third and fourth years are spent at both institutions.

Admissions:

The program is competitive and admission is based on academic performance and potential for success in the medical sciences.

Field of Study: Public Health

Graduate Courses

299. Individual Study in Dutch for Graduate Students.

(1-6) Course may be repeated for credit.

Individual study for graduate students engaged in exploration of a restricted field, involving the writing of a research paper. (F,SP) Staff

174. Brussels: A Global Study of a European Capital City. (4) Three hours of lecture and one hour of discussion per week. This course is offered in the spring semester and is designed to provide an introduction to the history, culture, and politics of Brussels, the capital of the European Union. The course will cover topics such as the history of Brussels, the role of the European Union, and the city's cultural and political landscape.

175. The Jews of the Low Countries. (3) Three hours of lecture per week. A survey of the history of Jewish communities in the Netherlands from early medieval times until today. This course will cover topics such as the history of the Sephardic and German Jews in Amsterdam, the history of the Jews in the Dutch Republic and the kingdom of Belgium, and the history of Jewish communities in the Netherlands from the Middle Ages to the present day.

C179. The Jews of the Low Countries. (3) Three hours of lecture per week. A survey of the history of Jewish communities in the Netherlands from early Middle Ages until today. This course will cover topics such as the history of the Sephardic and German Jews in Amsterdam, the history of the Jews in the Dutch Republic and the kingdom of Belgium, and the history of Jewish communities in the Netherlands from the Middle Ages to the present day.

C178. Cultural Studies. (3,4) Three hours of lecture/discussion per week. This course is offered in the spring semester and is designed to provide an introduction to the history, culture, and politics of Brussels, the capital of the European Union. The course will cover topics such as the history of Brussels, the role of the European Union, and the city's cultural and political landscape.

179. Cultural Studies. (3,4) Three hours of lecture/discussion per week. This course is offered in the spring semester and is designed to provide an introduction to the history, culture, and politics of Brussels, the capital of the European Union. The course will cover topics such as the history of Brussels, the role of the European Union, and the city's cultural and political landscape.

190. Senior Thesis. (4) One-half hour consultation per week. A research project in the areas of Dutch literature, culture, or the area of linguistics.

H190. Honors Studies in Dutch. (1-4) Course may be repeated for a maximum of 4 units. Prerequisites: Advanced standing. Supervised independent study and research course for honors students. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. (F,SP) Staff

199. Special Studies in Dutch. (1-4) Course may be repeated for credit. Individual conference. Must be taken on a passed/not passed basis. Prerequisites: Overall GPA of 3.0. Enrollment is restricted by regulations in this catalog. (F,SP) Staff

Graduate Courses

299. Individual Study in Dutch for Graduate Students. (1-6) Course may be repeated for credit. Individual conference. For graduate students engaged in exploration of a restricted field, involving the writing of a research paper. (F,SP) Staff
written report or ongoing field notebook is required. One unit of credit represents three hours of work per week on the part of the student. (F,SP) Staff

198. Directed Group Study. (1-3) Course may be repeated for credit. One to three hours of directed group study must be taken on a satisfactory/unsatisfactory basis. Organized group study on topics selected by Health and Medical Sciences Program graduate students under the sponsorship and direction of a member of the faculty. (SP) Steinbach, Swartzberg

Graduate Courses

200. Contextual Integrated Case-Based Curriculum. Ten and one-half hours of seminar per week. Prerequisites: Graduate standing in Health and Medical Science Joint Medical Program. The six semester sequence introducing graduate students to the medical basic science, health policy, public health, and clinical aspects of medicine taught in a contextual-integrated case-based format. The sequence includes curriculum in biochemistry, histology, microbiology, immunology, neuroanatomy, pathology, physiology, pharmacology, and clinical sciences. (F,SP) Swartzberg, Staff

202A. Clinical Skills 1. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program. The first course in a six-semester sequence introducing first-year medical students to the skills necessary to obtain a complete medical history, manage successfully the dynamics of the doctor-patient interaction, and master interpersonal communication skills required of doctors in a clinical setting. (F) Mcco

202B. Clinical Skills 2. (2) Three hours of lecture/laboratory offered alternate weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program and completion of all requirements of Health and Medical Sciences 202A. Students learn the basic anatomy, physiology, and function of the head and neck, bone, and muscle. Students will perform a complete medical history and physical exam with their preceptor. The dynamics of the physician-patient relationship are discussed on an ongoing basis. Each student is required to turn in at least five patient write-ups per term. (SP) Mcco

202C. Clinical Skills 3. (2) Three hours of lecture/lab offered alternate weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program and completion of all requirements of Health and Medical Sciences 202A and 202B. Students learn about the neurologic, musculoskeletal, renal, endocrine, eye, and ear systems. Students will perform a complete medical history and physical exam with their preceptor. The dynamics of the physician-patient relationship are discussed on an ongoing basis. Each student is required to turn in at least five patient write-ups per term. (F) Stevens, Swartzberg

202D. Clinical Skills 4. (2) Three hours of lecture/lab offered alternate weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program and completion of all requirements of Health and Medical Sciences 202C. Students learn the male genito-urinary exam and practice the complete medical history and physical exam with their preceptor. The dynamics of the physician-patient relationship are discussed on an ongoing basis. Each student is required to turn in at least five patient write-ups per term. (SP) Stevens, Swartzberg

202E. Clinical Skills 5. (2) Three hours of lecture/lab offered alternate weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences Joint Medical Program and completion of all requirements of Health and Medical Sciences 202C and 202D. Students learn the gynecologic exam and practice the complete medical history and physical exam with their preceptor. The dynamics of the physician-patient relationship are discussed on an ongoing basis. Each student is required to turn in at least five patient write-ups per term. (F) Stevens, Swartzberg

202F. Clinical Skills 6. (1) Three hours of lecture/lab oratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in HMS Joint Medical Program. Under supervision, students perform a complete history and physical exam on hospitalized or clinic patients five times during the semester. They present the patients in written and oral format for class discussion. These presentations are critiqued and the tools to effectively present cases are taught. The course runs for the first half of the student’s last term in the program. Each student will turn in at least three patient write-ups. (SP) Stevens, Swartzberg

210. Readers’ Theater—Topics on Medicine in Society. (1) Course may be repeated for credit as topic varies. Three hours of seminar per week for eight weeks. Prerequisites: Graduate standing or consent of instructor. In readers’ theater, texts are not written explicitly for the stage are adapted for public performances. Students thus learn about a subject by performance of relevant literature and discussion with involved audiences. In this course, selected stories deal with many aspects of medicine in context, e.g., dying, childbearing, aging, living with chronic pain, biomedical ethics, and disparities in care. The stories are selected to engage students of all ages, care-givers, patients, and providers. Mcco

211. Narrative and Medicine. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: Graduate standing in Health and Medical Sciences Program of instruction in the Arts. This course is designed to help medical students to think, write about, and discuss feelings engendered by clinical encounters. Medical students are taught the need to be emotionally detached from patients. Successful emotional detachment does not mean devoid of emotion. This course offers a means to express and analyze those feelings. Also considered is the value of regarding the medical history as “text” which can be written and read for different, equally valid viewpoints. (F,SP) Mcco

212. Health and Human Rights. (1) Two hours of seminar for five weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in Health and Medical Sciences 211. Public health and human rights are two complementary approaches to protecting and promoting human well-being and dignity. Enshrined in international law, human rights guarantee that individuals must create conditions where individuals can achieve their full potential. Human rights abuses profoundly affect health; health policies can directly or indirectly impact human rights adversely. In this course students will explore interrelationships and examine how the “right to health” is challenged both in war and peace. (F) Stover, Weinstein

215. The Interdisciplinary Team: Improving the Care of Our Elders. (2) Two hours of seminar per week, plus field work. Prerequisites: Limited to health care professional graduate students at UCB, UCSF, Samuel Merritt University, and GTU students. Through field experiences, readings, film, and discussions with multi-specialty healthcare professionals, students will gain an understanding of the roles, function, and dynamics of the geriatric interdisciplinary team (GIT). We will compare and contrast the unique perspectives, values, and contributions of each profession, and develop strategies for effective interprofessional teaming as well as analyze how participation in a team setting will affect their own future professional practice. (SP) Mcco, Robinson

240. The Death Course. (2) Two hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. This course is intended for medical students who share a keen interest in the problem of death. The topic will be explored from various religious, cultural, and personal perspectives through the use of literature, in-class writing and discussion, and discussion of films and music. A 10-15 page paper will be required. Mcco

261. Research Seminar. (1-2) Two hours of seminar per week. Prerequisites: Graduate standing in Health and Medical Sciences UCSF-UCSF Joint Medical Program. A seminar to help Joint Medical Program students acquire skills necessary to define a research question, find appropriate mentors, and design a research project. Summer course introduces research design, methods, and expectations for M.S. research in health and medical sciences. Fall and spring semesters address topics in research; student progress toward M.S. thesis is reviewed and critiqued. Development of research plan, protocol design and implementation, and research findings will be reviewed. Each student takes this course three times in the first year. (SP) Auerwald, Staff

296. Special Study. (1-10) Course may be repeated for credit. Individual meetings with faculty members. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Designed to permit study of special topics not covered in special study under the direction of a faculty member. (F,SP) Staff

298. Directed Group Study. (1-5) Variable. Sections 1-8 to be graded on a satisfactory/unsatisfactory basis. Sections 9-17 may be taken for a grade with department approval. Prerequisites: Graduate standing in Health and Medical Sciences Program or consent of instructor. Group study for graduate students. Intensive examination of health-related topics. (F,SP) Staff

299. Independent Study and Research in Health and Medical Sciences. (1-12) Course may be repeated for credit. In consultation with the unit of credit represents four hours of student work per week in the regular semester. Prerequisites: Graduate standing in HMS Program or consent of sponsoring HMS faculty member. Independent study, research, and writing in a program of study, sponsored by an approved faculty member and approved by program advisor. (F,SP) Staff

Health Services and Policy Analysis (School of Public Health, Interdepartmental Graduate Groups)

Department Office: 247C University Hall, (510) 643-8571
Chair: William Dow, Ph.D.
Professors
Joan Bloom, Ph.D. (Public Health)
Ralph Catalano, Ph.D. (Public Health)
Sylvia Guemeldienst, M.S. (Public Health)
S. W. Trivedi, M.D. (Public Health)
Helen Ann Haagen, Ph.D. (Public Health)
S. W. Trivedi, M.D. (Public Health)
James Robinson, M.P.H., Ph.D. (Public Health)
Richard Schiffer, Ph.D. (Public Health)
Stephan Shortell, M.P.H., Ph.D. (Public Health)
Lorraine Snowden Jr., M.S. (Social Welfare)
Associate Professor
Lisa Fernald, Ph.D. (Public Health)
Assistant Professor
Ann Keller, Ph.D. (Public Health)

Overview
The Ph.D. Program in Health Services and Policy Analysis is interdisciplinary: courses are taken in several departments and schools across campus. Students receive a Ph.D. degree from the Graduate Division of the Berkeley campus. The group is within the academic jurisdiction of the Graduate Council and is administratively located in the Division of Health Policy and Management in the School of Public Health. The larger faculty group includes individuals from the Departments of Economics, Political Science, and Demography, the Haas School of Business, and Goldman School of Public Policy. The group integrates and applies disciplinary knowledge from the social sciences to the health care system. Students receive a thorough grounding in research methods and the application of these methods to the analysis of health policy
History
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Department Office: 3292 Divinelle Hall, (510) 642-1971
history.berkeley.edu

Professors
Anthony Ad�thwaite, Ph.D. University of Leeds. Late modern Europe, international relations
Andrew E. Banks, Ph.D. University of California, Berkeley. East Asia, modern Japan
Mary E. Berry (Chair), Ph.D. Harvard University. Japan
Richard C. Bulliet, Ph.D. University of California, Los Angeles. U.S. cultural, intellectual, oral history theory and methods
Margaret Chowning, Ph.D. Stanford University. Latin America, Mexico
Jan de Vries (The Sidney Hellman Ehrman Professor of European History), Ph.D. Yale University. European economics
Beshara Doumani, Ph.D. Georgetown University. Modern Middle East, Arabia
John Eflon (The Koret Professor of Jewish History), Ph.D. Columbia University. Modern Jewish history
Robin L. Einhorn, Ph.D. University of Chicago. 19th-century United States, intellectual history
Susanna K. Elm, Ph.D. Oxford University. Late antiquity, early Christianity
David Hearn, Ph.D. University of California, Berkeley. 19th-century United States
Catha A. Hesse (The Pytheas Sather Professor of History), Ph.D. Princeton University. Early modern Europe, social and political
David A. Hollinger (The Preston Holch Professor of the History of the United States), Ph.D. University of California, Berkeley, intellectual
Martin E. Jay (The Sidney Hellman Ehrman Professor of European History), Ph.D. Harvard University. Modern Europe, intellectual
David G. Johnson, Ph.D. University of California, Berkeley. East Asia, pre-modern China
Tabitha M. Kanogo, Ph.D. University of Nairobi. Africa
Keren Kesier, Ph.D. University of California, Los Angeles. U.S. cultural, intellectual, and political
Geoffrey G. Kosso, Ph.D. Princeton University. Medieval Europe, France
Thomas W. Laqueur (The Helen Fawcett Distinguished Professor of History), Ph.D. Princeton University, Britain, social, history of medicine
Waldo E. Martin Jr., Ph.D. University of California, Berkeley. Recent United States, black, cultural, intellectual
Maria Mavroudi, Ph.D. Harvard University. Byzantine studies
Maureen Miller, Ph.D. Harvard University. Medieval Europe, Italy, ecclesiastical
Michael Nyhan, Ph.D. Princeton University. East Asia, early China
Peppe Sahlins, Ph.D. Princeton University. Early modern Europe, France, Catalonia
Yuri Szekely, Ph.D. The Kupferberg Center for the History of the Cold War. Ph.D. University of Texas, Austin. Late modern Europe, Russia
Tyler Stovall, Ph.D. University of Wisconsin, Madison. Late modern Europe, European history, urban, colonial and postcolonial, social and cultural
James Verno, Ph.D. Manchester University. Modern Britain
Wen-Hsiung Yeh (The Nichand H. and Laurie C. Morrison Endowed Chair in History). Ph.D. University of California, Berkeley. Modern China, social and cultural
Richard M. Abrams (Emeritus), Ph.D.
Margarete L. Anderson (Emerita), Ph.D.
Thomas A. Brady (Emeritus), Ph.D.
William Taylor (Emeritus), Ph.D.
Randolph Starn (Emeritus), Ph.D.
Brian DeLay, Ph.D. Harvard University. Indians of North America
Prachi Deshpande, Ph.D. Tufts University. South Asia
Massimo Mazzotti, Ph.D. University of Edinburgh. History of science and technology
Rebecca McLemore, Ph.D. Columbia University. America since 1607: U.S. social, political, and labor; crime and punishment
Carlos Norena, Ph.D. University of Pennsylvania. Ancient Rome
Mark Peterson, Ph.D. Harvard University. America since 1607, colonial
Eliza Shogan, Ph.D. Princeton University. Early modern Britain, English Reformation
Jonathan Sheehan, Ph.D. University of California, Berkeley. Early modern Europe, religion, science
Peter B. Zinoman, Ph.D. Cornell University. Southeast Asia, Vietnam
Assitant Professors
Mark Brilliant, Ph.D. Stanford University. 20th-century United States, the American West
Alexander Cook, Ph.D. Columbia University. Law, literature, and history of modern China
Victoria Fregie, Ph.D. University of California, Berkeley. Late modern Europe; imperial Russia
Mark Healy, Ph.D. Duke University. Modern Latin America: Argentina; architecture, urban, cultural, political
Emily Macki, Ph.D. Princeton University. Ancient Greece
Irena Ossevo-Aseas, Ph.D. Harvard University. Africa: medicine and science
Daniel Sargent, Ph.D. Harvard University. U.S. foreign relations, global and international history
Nicolas Tackett, Ph.D. Columbia University. Medieval history of China
Associate Adjunct Professor
Emily Gottreich, Ph.D. Harvard University, Middle Eastern studies
Assistant Adjunct Professor
Stephen Astoriaun, Ph.D. University of California, Los Angeles. Armenian studies

Professors
Charles G. Sellers (Emeritus), Ph.D.
John M. Smith Jr. (Emeritus), Ph.D.
William Totten (Emeritus), Ph.D.
H. Franz Schumann (Emeritus), Ph.D.
Raphael Sealey (Emeritus), M.A.

Assistant Professors
Cathryn Carson, Ph.D. Harvard University. History of science, modern physics
John Connelly, Ph.D. Harvard University. Late modern Europe, 20th-century East Central Europe
Thomas Dandzetel, Ph.D. University of California, Berkeley. Mediterranean, Spain
Brian DeLay, Ph.D. Harvard University. Indians of North America
Prachi Deshpande, Ph.D. Tufts University. South Asia
Massimo Mazzotti, Ph.D. University of Edinburgh. History of science and technology
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Daniel Sargent, Ph.D. Harvard University. U.S. foreign relations, global and international history
Nicolas Tackett, Ph.D. Columbia University. Medieval history of China

Associate Adjunct Professor
Emily Gottreich, Ph.D. Harvard University, Middle Eastern studies
Assistant Adjunct Professor
Stephen Astoriaun, Ph.D. University of California, Los Angeles. Armenian studies

Department Overview
The Department of History offers a program of instruction leading widely to the historical record of human experience. The chronological, geographical, and topical range affords great flexibility to students working toward degrees in history and those who wish to give a historical dimension to their studies in other disciplines. Lecture courses and seminars are available to students at introductory and advanced levels.

The Major
The major in history consists of 12 courses (usually for a total of 49 units), at least 11 of which must be completed within the Department of History. Students may be allowed to include one course from another department in constructing their “fields” of concentration (see below).

Individual programs must satisfy both lower and upper division requirements. They must also include at least one course devoted entirely to premodern history (to be selected from courses focused on one or more of the following eras: antiquity, the classical period, and the medieval period; courses dealing solely with the early modern period do not satisfy this requirement).


Students may declare the major after completing three courses in the Department of History, including at least two courses in the lower division.

Lower Division Requirements.
Four courses, to include the following:
• one survey course on the history of the United States;
• one survey course on the history of Europe;
• one survey course on the history of another world area;
• one elective (of any additional offering, including History R1, 2, and 39).

Students may substitute one upper division course for any of the first three requirements.

Upper Division Requirements.
Eight courses, to include the following:
• one upper division course (one seminar (History 103); one research seminar (History 101). At least four upper division courses must constitute a field of concentration, which is defined by at least one of the following rubrics:
  • a period (such as the ancient world, the medieval world, the 20th century, or a similarly broad temporal span);
  • a geographical area (such as Eastern Europe, China, the Mediterranean, or a similarly broad spatial expanse);
  • a thematic approach (such as science and medicine, law, popular culture, religion, or a similarly broad subject matter).

The four courses constituting the field of concentration must include History 101. The three additional courses in the field of concentration may include History 103. They may also include one appropriate upper division course (of at least 3 units) from another department. Students must secure approval for their fields of concentration from the Committee on the History Undergraduate Major (CHUM) two semesters before graduation (thus, for example, during the spring of the junior year for majors expecting to graduate that following spring).

While individual majors must define their own particular fields of concentration, CHUM offers the following sample of possible fields to assist students in making their decisions.

Fields Defined by Period:
• an era (for example, the ancient period, the medieval period, the early modern period);
• a century (for example, the 13th century, the 18th century, the 19th century);
• an age of transregional connection or crisis (for example, the age of global voyages, the age of revolution in Europe and North America, the age of nation-building in the Middle East).

Fields Defined by Geographical Area:
• a national unit (for example, China, France, Kenya, Mexico);
• an empire (for example, the Roman Empire, the Byzantine Empire, the Ottoman Empire, the Span-
Higher Degrees

Students planning to work toward the degrees of M.A. and Ph.D. should address inquiries to Graduate Admissions, Department of History. Candidates will be admitted for the fall semester only.

Further Information

The online Schedule of Classes issued before each semester and the department's descriptions issued at the beginning of each semester will provide further detailed information about the courses offered by the Department of History, including when and by whom each course will be given.

Lower Division Courses

R1. The Practice of History. (4) Three hours of lecture and two hours of discussion per week. Intended for nonmajors as well as prospective majors, this course introduces students to the discipline of history and helps them think about the experiences of people in time and space. How do historians interpret and debate the past? How do they gather and make use of their materials and sources? Readings include the works of classical historians from different cultural traditions, contemporary historical debates, and an exploration of historical sources available at Berkeley. Satisfies half of the Reading and Composition requirement. (F,SP)

2. Comparative World History. (4) Three hours of lecture and two hours of discussion per week. This lower-division lecture course introduces students to the study of history in multiple periods and regions. It will typically be co-taught by faculty members with different geographical and chronological expertise and will center around a particular theme, such as cities, food cultures, or war and society. No prior coursework in the history of any particular part of the world will be expected. (F,SP)

3. After the Roman Empire: the East. (4) Three hours of lecture and two hours of discussion per week. A general introduction to the study of history, this course focuses on Byzantium and the Islamic world, two medieval successors to the Roman empire in the Eastern Mediterranean and the Near East. This course offers an introduction to the cultural, religious, and political developments in the regions that emerged as major economic and strategic powers. (F,SP)

4. Origins of Western Civilization. Three hours of lecture and two hours of discussion per week. Introductory study of major historical events in the origins of Western civilization. Emphasis on class discussions, readings in the sources, and writing of essays. (F,SP)

4A. The Ancient Mediterranean World. (4) This course offers an introductory survey of the history of the ancient Mediterranean world, from the rise of city states in the Eastern Mediterranean and the Near East to the transformation of the Roman Empire in the fifth and sixth centuries A.D. The emphasis will be on the major developments in the political and social history of the ancient Near East, Egypt, Greece, and Rome, with special attention to those institutions, practices, ideas, and objects that have had an enduring influence on the development of Western civilization. (F,SP)

5. European Civilization from the Renaissance to the Present. (4) Three hours of lecture and two hours of discussion per week. This course is an introduction to European history from around 1500 to the present. The central questions that it addresses are how and why Europe—a small, relatively poor, and politically fragmented place—became the motor of globalization and a world civilization in its own right. Put differently how did “western” become an adjective that, for better and often for worse, stands in place of “modern.” (F,SP)

6. China. Three hours of lecture and two hours of discussion per week. (F,SP)

6A. History of China: Origins to the Mongol Conquest. (4) Formerly 13A. The history of China from its beginnings to the destruction of the Song Dynasty by the Mongols in the 13th century. Topics to be covered include the emergence of Chinese civilization, the Chinese language, early rhetoric and philosophy, the creation of the first empire, law, Buddhism and religious Taoism, the socioeconomic revolution of the 10th to 12th centuries, identities (male and female, Chinese and “barbarian”), lyric poetry, and painting and calligraphy. Comparisons between China and Europe will be made at strategic points. (F,SP)

6B. Introduction to Chinese History from the Mongols to Mao. (4) Formerly 13B. This is an introduction to Chinese history from the 13th through the 20th centuries—from the Mongols and Kublai Khan’s conquest of southern China to the amazing turnaround following the death of Mao Zedong in 1976 and the opening of the era of reform that has led to China’s emergence as a major economic and strategic power today. The course assumes no prior knowledge of Chinese history. (F,SP)

7. Introduction to the History of the United States. Two to three hours of lecture and two hours of discussion per week. (F,SP)

7A. The United States from Settlement to Civil War. (4) This course is an introduction to the history of the United States from the beginning of the European colonization of North America to the end of the Civil War. It is also an introduction to the ways historians look at the past and think about evidence. There are two main themes: (1) how the “two ways” we think about the “two peoples” on either side of the “national” divide—called “Europeans” or “Native Americans” or “African-Americans,” and (2) ways to understand how domestic political institutions emerge and evolve. (F,SP)

7B. The United States from Civil War to Present. (4) What does it mean to be American? Whatever your answer to this question is, American history is deeply connected to the themes and events we will discuss in this class. Here we will track America’s rise to global power, the fate of freedom in a post-Emancipation society, and the changing boundaries of nation, citizenship, and community. We will use landmark events to sharpen our themes, but we will also take care to analyze the equally important (and shifting) patterns of where and how Americans lived, worked, and played. (F,SP)

8. Latin American History. Three hours of lecture and two hours of discussion per week. (F,SP)

8A. Becoming Latin America, 1492 to 1824. (4) This course covers the history of Latin America from the time of Columbus to around 1870. It thus reckons with almost four centuries of encounter, colonization, independence, and struggle and that frame the ways that Latin America was becoming Latin American. Lectures and a mix of secondary and primary source readings and images produced during the colonial period serve as points of entry for discussion in section meetings. (F,SP)

8B. Modern Latin America. (4) This introductory course surveys the history of modern Latin America from independence to the present, with a strong emphasis on the 20th century. Our focus is on broader transformations in politics, place, identity, and work. (F,SP)

10. African History. (4) Three hours of lecture and two hours of discussion per week. An introductory survey of the history of Africa. (F,SP)

11. India. (4) Three hours of lecture and two hours of discussion per week. (F,SP)

12. The Middle East. (4) Three hours of lecture and two hours of discussion per week. (F,SP)
with a topic with which they are especially concerned, for credit. Four hours of lecture/discussion per week.

Upper Division Courses

100. Special Topics. (4) Course may be repeated for credit. Four hours of lecture/discussion per week. Designed to give the instructors, to a greater extent than usual, the opportunity to deal with a topic with which they are especially concerned, usually more restricted than the subject matter of a regular lecture course. A combination of informal lectures and discussions, term papers, and examinations, with all grading by the instructor. Instructors and subjects to vary. Consult department catalog during pre-enrollment week each semester. (F,SP)

100A-C. Special Topics. (4) Four hours of lecture/discussion per week. Designed primarily to permit the instructors to deal with a topic with which they are especially concerned, usually more restricted than the subject matter of a regular lecture course. A combination of informal lectures and discussions, term papers, and examinations, with all grading by the instructor. Instructors and subjects to vary. (F,SP)

101. Seminar in Historical Research and Writing for History Majors. (5) Three to four hours of lecture per week. Individual research projects carried out in seminar sections in various historical fields resulting in a lengthy paper, with readings and discussions of general problems of historical inquiry. In addition to regular class meetings, individual consultations with the instructor, research, and preparation totaling 10 to 12 hours per week. (F,SP)

103. Seminar: Problems in Interpretation in the Several Fields of History. Course may be repeated for credit with consent of instructor. Three hours of seminar/discussion per week. Prerequisites: Consent of instructor. Designed primarily to give majors in history elementary training in historical criticism and research. Emphasis will be placed on writing and discussion. For precise schedule of offerings, see department catalog during pre-enrollment week each semester. (F,SP)

103A. Ancient. (4) (F,SP)
103B. Europe. (4) (F,SP)
103C. England. (4) (F,SP)
103D. United States. (4) (F,SP)
103E. Latin America. (4) (F,SP)
103F. Asia. (4) (F,SP)
103H. Africa. (4) (F,SP)
103I. History of Science. (4) (F,SP)
103U. Studies in Comparative History. (4) (F,SP)
105. Ancient Greece. Three hours of lecture and one hour of discussion per week. (F,SP)
105A. Archaic and Classical Greek History. (4) An overview of the history of the Greek world from the Bronze Age to 404 BC. Major themes will include the ecological development of the Mediterranean; development of the polis; colonization; tyranny and democracy; religion; warfare; agriculture and commerce; interstate relations; the Persian Wars; Sparta and the Peloponnesian League; and Athens and the Athenian Empire. Most readings will be in translated primary sources, including Herodotus, Thucydides, Aeschylus, Aristophanes, and documentary evidence such as laws, treaties, and decrees. (F,SP)
105B. The Greek World: 403-31 BCE. (4) An overview of the history of the Greek world from the end of the Peloponnesian War to the Battle of Actium, the final stage in the Roman conquest of the Hellenistic world. Major topics will include: Greek-Persian relations in the fourth century; the rise of Macedon under Philip II; the conquests of Alexander the Great; the Hellenistic kingdoms; cultural interactions between Greeks and non-Greeks; Hellenistic economics; and the Roman conquest of the Greek world. Most readings will be in translated primary sources. (F,SP)
106. Ancient Rome. Three hours of lecture and one hour of discussion per week.
106A. The Roman Republic. (4) A history of Rome from the foundation of the city to the dictatorship of Caesar. The course examines the evolution of Republican government, the growth of Roman imperialism, and the internal disruptions of the age of the Gracchi, Sulla, and Pompey. (F,SP)
106B. The Roman Empire. (4) A history of Rome from Augustus to Constantine. The course surveys the struggles between the Roman emperors and the senatorial class, the relationship between civil and military government, the emergence of Christianity, and Roman literature as a reflection of social and intellectual life. (F,SP)
107. Topics in Ancient History. Three hours of lecture and one hour of discussion per week.
108. Byzantium. (3) Three hours of lecture and one hour of discussion per week. The social, cultural, and religious history of the Near East and eastern Mediterranean from late antiquity through the early middle ages. The survival of the Roman Empire in Byzantium, the Sassanian Empire in Iran, and the rise of Islam are the topics covered.
109A. The Rise of Islamic Civilization, 600-1200. (4) Three hours of lecture and one hour of discussion per week. A survey of Islamic civilization in the Middle East during the medieval period. Topics include the emergence of Islam in Arabia and the role of the Umayyads and the Abbasids in the establishment of the caliphate and its effects on the societies it governed; the creation of an Islamic civilization and the religious, political, and intellectual debates it engendered; contact with Europe and Asia through trade, the Crusades, and nomadic conquest; and the contributions of non-Muslims, women, slaves. (F,SP)
109B. The Middle East, 1000-1750. (4) Three hours of lecture and one hour of discussion per week. The establishment of Turkish power in the Middle East: Seljuks, Mongols, Ottomans, and Safavids.
109C. The Middle East From the 18th Century to the Present. (3) Three hours of lecture and one hour of discussion per week. This course studies the empire’s expansion into Europe, Asia, and Africa; the multiple influences on its formation (Roman, Persian, Islamic, Mongol, Turkish); imperialism in the pre-modern era; the rich polyglot culture of the empire’s peoples (Christians, Jews, and Muslims; Arabs, Greeks, Kurds, Turks, Armenians, Slavs, and others); forms of religious identity (orthodoxies, mysticisms, heresies); contrasting lives of the Arab, Chaldean, Kurdish, Turkish, and Jewish population; and cultural shifts across three centuries. (F,SP)
110. The Ottoman Empire, 1400-1750. (4) Three hours of lecture and one hour of discussion per week. The Ottoman Empire is the most influential empire in modern Southeast Asia. The course will focus on the growth and development of the empire from the foundation of the city to the dictatorship of Caesar. The course examines the evolution of Republican government, the growth of Roman imperialism, and the internal disruptions of the age of the Gracchi, Sulla, and Pompey. (F,SP)
110A. The Ottoman Empire, 1400-1750. (4) Three hours of lecture and one hour of discussion per week. The Ottoman Empire is the most influential empire in modern Southeast Asia. The course will focus on the growth and development of the empire from the foundation of the city to the dictatorship of Caesar. The course examines the evolution of Republican government, the growth of Roman imperialism, and the internal disruptions of the age of the Gracchi, Sulla, and Pompey. (F,SP)
110B. Modern Southeast Asia. (4) Major themes in modern Southeast Asian history with an emphasis on cross-country comparisons involving the region’s largest and most populous countries: Thailand, Burma, Vietnam, Indonesia, and the Philippines. Also listed as Southeast Asian C141B. (F,SP) Staff
111B. Modern Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. Major themes in modern Southeast Asian history with an emphasis on cross-country comparisons involving the region’s largest and most populous countries: Thailand, Burma, Vietnam, Indonesia, and the Philippines. Also listed as Southeast Asian C141B. (F,SP) Staff
111C. Political and Cultural History of Vietnam. (4) This course provides an introduction to the main issues in Vietnamese history from the mythic and archæological origins of the modern nation-state to the end of the Second Indochina War in 1975. Special emphasis will be placed on "modern" developments from the late 18th century. In addition to history texts, readings will be taken from novels, short stories, poetry, and memoirs. (F,SP)
112. Africa. Three hours of lecture and one hour of discussion per week.
112B. Modern South Africa, 1652-Present. (4) This course will examine three centuries of South African history that account for the origin and development of the recently dismantled apartheid regime. Our aim is to understand the major historical forces that progressively shaped what became a turbulent socio-cultural, economic, political, and racial frontier. (F,SP)
113A. Traditional Korean History. (4) Three hours of lecture and one hour of discussion per week. This course surveys major issues in Korean history from the origins of the Korean people to the 19th century.

113B. Modern Korean History. (4) Three hours of lecture and one hour of discussion per week. This course will survey major social, economic, and political developments on the Korean peninsula from the middle of the 19th century.

114. India. Three hours of lecture and one hour of discussion per week.

114A. Medieval and Early Modern India to the Coming of the British. (4) This course will have two projects in this course. The first of these is to understand, in so far as the sources permit, the nature of state structure in the Indian area between 1000 and 1800 CE. The second of these is to look at periods from the sixteenth century onward. We shall have described the history and the society of this period to understand the way in which the Indian state and its society has been constructed. This will involve reading in both substantive texts and theoretical works.

114B. Modern South Asia. (4) Here we will deal with the history of South Asia between the coming of the Europeans and the present. It will be organized around a series of contested formulations about the recent South Asian past. One of these problems is: how was India conquered and how was it and manipulated by the Europeans? The second problem is: how was India conquered, by the sword or by the word? The third is: how did Indians resist the British? Finally: how was this resistance employed by the lower classes, and others expressed and heard? We will read books about language, gender, the "subaltern" classes, and women in an attempt to understand these questions.

116. China. Three hours of lecture and one hour of discussion per week.

116A. Early China. (4)

116B. Two Golden Ages: China During the Tang and Song Dynasties. (4) This course explores Chinese history during the Tang and Song periods, focusing on the Sui and early Tang, and the Song Dynasty. In the Tang Dynasty, China experienced its first golden age, a period of great social, economic, and cultural development. The Song Dynasty followed, marked by advancements in science, philosophy, and the spread of Buddhism. This course will examine the political, social, and cultural aspects of these periods, exploring the contributions of scholars, artists, and scientists.

116C. Modern China. (4)

116D. Twentieth-Century China. (4) Chinese history from the decline of the Qing empire to the reforms under the Chinese Communist Party in the late 20th century. This course will cover significant events such as the辛亥革命 (Xinhai Revolution), the Chinese Civil War, and the establishment of the People's Republic of China. We will explore the impact of these events on Chinese society and politics.

117. Topics in Chinese History. Three hours of lecture and one hour of discussion per week.

117A. Chinese Popular Culture. (4) It is impossible to understand Chinese history and culture without knowing what ordinary people thought, felt, and believed. In this course, our primary concerns will be: (1) village culture and society and the problems they raised; (2) village festivals and domestic rituals; (3) the rituals and scriptures of local cults; (4) opera, storytelling, and other forms of village entertainment; and (5) popular visual arts. These subjects will be studied through both historical documentation and popular tales.

117D. The Chinese Body: Gender and Sex, Health, and Medicine. (4) This course brings a thematic approach to the critical analysis of the "Chinese body," as constructed before the 20th century, from four main perspectives, those of: (1) gender, (2) sexual activity, (3) health, and (4) medicine. A variety of sources, material and literary, attest to changing perceptions over the centuries, and a continuing use of standard vocabulary for Yin/Yang and the Five Phases frequently masked innovations.

118. Japan. Three hours of lecture and one hour of discussion per week.

118A. Japan, Archaeological Period to 1800. (4) Emphasis on political, cultural, and intellectual history of the Early Imperial State, Japan's first military government (Kyoto, 600-1000 CE), a period that includes the Heian Period and the Nara Period. The course will cover major events and important figures in Japanese history, focusing on the development of the central government, the role of the emperor, and the spread of Buddhism and Shintoism.

118B. Japan, 1800-1900. (4) Emphasis on the social and intellectual history of Japan's pre-war reconstruction.

118C. Empire and Alienation: The 20th Century in Japan. (4) Japan's experience of the 20th century, beginning with the development of capitalism and the acquisition of power, and the effects of these achievements and traumas on the society and politics of Japan. The course will cover major events in Japan's history, including World War II, the Occupation of Japan, and the postwar economic miracle.

119A. Postwar Japan. (4) Three hours of lecture and one hour of discussion per week. This course considers the history of Japan since the end of World War II, beginning with an exploration of the war itself and its complex legacy to the postwar era. Using the best recent scholarship and a selection of translated novels, essays, and poetry along with film and art, we will look at the six postwar decades and the transformations of Japanese life that those years have brought. We will try to answer the question: has "post-war" itself come to an end?

120AC. American Environmental and Cultural History. (4) Three hours of lecture and one and one-half hours of discussion per week. Formerly C120. History of the American environment and the ways in which different groups and the environment were perceived, used, managed, and conserved it from colonial times to the present. Includes American Indians and European and African Americans. Natural resources development in the Southwest is examined, including mining, ranching, forestry, and urbanization. Changes in attitudes and behaviors toward nature and past and present conservation and environmental movements are also examined. This course fulfills the History Department's Writing Requirement.

121. The Colonial Period and American Revolution. Three hours of lecture and one hour of discussion per week.

121A. American History, the Colonial Period: The People and Cultures of Early America. (4) America has always been a multicultural society and perhaps at no time was this more true than in the 17th and 18th centuries. In this course, we will analyze the experiences of Native Americans, African Americans, and Europeans from the 17th century through the 18th century. The course will consider race relations, particularly between blacks and whites in America.

121B. American Revolution. (4)

122. The United States, 1787-1845. (4) Three hours of lecture and one hour of discussion per week.

122AC. Antebellum America: The Advent of Mass Society. (4) Three hours of lecture and one hour of discussion per week. This course examines the development of the mass society in the United States from the late 18th century to the Civil War. It covers the growth of political parties, the expansion of democracy, and the rise of new social classes. The course will also examine the antebellum period, focusing on the expansion of slavery and the development of the American South.

122B. Civil War and Reconstruction. (4) Three hours of lecture and one hour of discussion per week. This course will explore the causes of the Civil War, its effects on American society, and the Reconstruction era that followed. It will cover the political, social, and economic changes that occurred during this period, including the abolition of slavery, the founding of the United States as a constitutional republic, and the efforts to rebuild the南方 and to ensure civil rights for African Americans.

123. Civil War and Reconstruction. (4) Three hours of lecture and one hour of discussion per week. This course will take a broad view of the political, social, economic, and cultural history of the United States in the mid-19th century in order to explore both the causes of the Civil War and its effects on American development. Major topics will include slavery and race relations (north and south), class relations and industrialization, the organization of party politics, and changes ideas about and uses of government power.

124. The Recent United States. Three hours of lecture and one hour of discussion per week.

124A. The United States from the Late 19th Century to the Eve of World War II. (4) During the first half-century before World War II, the United States became an industrialized, urban society with national markets and communication media. This class will explore in depth some of the most important changes and how they were connected. We will also examine what did not change, and how state and local priorities persisted in some arenas. Among the topics addressed are population movements and efforts to control immigration; the growth of corporations and trade unions; the campaign for women's suffrage; prohibition; an end to child labor; the institution of the Jim Crow system; and the reshaping of higher education. This course satisfies the American Cultures requirement.

124B. The United States from World War II to the Vietnam Era. (4) Immediately prior to World War II, the U.S. military ranked 17th in the world, most African Americans were barred from voting; culture and basic science in the United States enjoyed no worldwide recognition; most married women did not work for wages; and the census did not count most African Americans as a separate group. By 1973, all this had changed. This course will explore these changes and other transformations, all part of the making of modern America. We will take care to analyze the events, significance and cost of U.S. ascendency to world power in an international and domestic context.

This course satisfies the American Cultures requirement.

125. History of African-Americans and Race Relations in the United States. Three hours of lecture and one hour of discussion per week. This course will examine the history of African Americans: their African backgrounds, slave experience, social and cultural experience since emancipation. The course will consider race relations, particularly between blacks and whites in America.

125A. The History of Black People and Race Relations, 1861-1985. (4) The course will survey African American history from the African background to the outbreak of the Civil War. The origins and development of African American society, culture and politics will be explored from the perspective of African Americans themselves: slave and free, North and South. Throughout, the enduring dilemma of race relations functions as a central theme.

125B. Soul Power: African American History 1861-1985. (4) This course will examine the history of African Americans and ethno-racial relations from the Civil War and Emancipation (1861-1865) to the modern African American Freedom Struggle (1954-1972). Social, cultural, economic, and political developments will be emphasized. Topics to be covered include: Black Reconstruction; black life and labor in the New South; leadership; class; gender; Jim Crow; migration; urbanization; war and social change; the Harlem Renaissance; civil rights; and Black Power.

126A-126B. The American West Since 1850. (4;4) Three hours of lecture and one hour of discussion per week. This course surveys the history of the American West since 1845. We will pay particular heed to the origins of the West that are typically associated with the American West since 1845. We will take care to analyze the events, significance and cost of U.S. ascendency to world power in an international and domestic context.

This course satisfies the American Cultures requirement.

127AC. California, (4). Three hours of lecture and one hour of discussion per week. Formerly 127. The history of California from pre-European contact to the present, with emphasis on the diversity of cultures and the interplay of state, social, economic, and political developments. This course satisfies the American Cultures requirement.
ories have contributed to inequality and injustice. Also of a distinct minority. Only in the past 200 years have schooling, and youth culture; changes in gender relations, family dynamics, the emergence of modern childhood, and contemporary changes in gender, the family and sexuality. Against the tapestry of 20th century American history, we will analyze how two dramatic changes—women’s entry into the paid labor force and their control over their reproductive lives—gave rise to our contemporary cultural wars over the family, sexuality, and reproduction. (F,SP)

136AC. Gender Matters in 20th-Century America. (4) Three hours of lecture and one hour of discussion per week. This course explores the social, political, cultural, and economic history of women and men’s lives, as well as changing sexual attitudes toward gender, the family and sexuality. Against the tapestry of 20th century American history, we will analyze how two dramatic changes—women’s entry into the paid labor force and their control over their reproductive lives—gave rise to our contemporary cultural wars over the family, sexuality, and reproduction. (F,SP)

137AC. The Repeopling of America. (4) Three hours of lecture and one hour of discussion per week. This course examines the coming together of people from five continents to the United States and provides an historical overview of the shifting patterns of immigration. The course begins in the colonial era when servants and slaves typified the migrant to America. It then follows the migration of the pre-industrial immigrants, through migration streams during the childhood and post-industrial eras of the nation. This course satisfies the American Cultures requirement. (F,SP)

138. History of Science in the United States. (4) Three hours of lecture and one hour of discussion per week. History of science in the United States from the colonial period to the present. Also listed as American Studies 139AC. This course satisfies the American Cultures requirement. (F,SP)

139C. Civil Rights and Social Movements in U.S. History. (4) Three hours of lecture and one hour of discussion per week. Beginning with the onset of World War II, America experienced not a singular, unitary Civil Rights Movement—as is typically portrayed in standard textbooks and the collective memory—but rather a variety of contemporaneous movements and their related activities. This course explores the history, presenting a top-down (political and legal history), bottom-up (social and cultural history), and comparative (by race and ethnicity as well as region) view of the civil rights struggles for racial equality from roughly World War II until the present. Also listed as American Studies 139AC. This course satisfies the American Cultures requirement. (F,SP)

140. Mexico. Three hours of lecture and one hour of discussion per week. (F,SP)

140B. Modern Mexico. (4) This course surveys Mexican history from the end of the colonial period to the present, with an eye to how the study of Mexican history can help us understand the Mexico of today. Topics include the historical origins of peasant rebellions and their influence on national politics; the tension between democratic pressures and the repressive economic policies; the powerful influence of the Catholic church; immigration to the United States; and the explosive 20th-century growth of Mexico City. (F,SP)

141. Social History of Latin America. Three hours of lecture and one hour of discussion per week. (F,SP)

141B. Social History of Modern Latin America. (4) Affirmation of the central state. Social conflicts in the 20th century: industrialization and agrarian conflict. (F,SP)

143. Brazil. (4) Three hours of lecture and one hour of discussion per week. From 16th-century conquest and settlement to the emergence of an industrial economy during the post-1964 period of military rule. Emphasis on dependence of colony on empire, plantation agriculture, slavery, export economy, and the transition from agrarian to industrial society. (F,SP)

146. Latin American Women. (4) Three hours of lecture and one hour of discussion per week. This course surveys the experiences and impact of women in Latin American history from the pre-conquest period to the present, as well as the ways that gender ideologies (like patriarchy, honor-shame, machismo) have influenced Latin American history. (F,SP)

149. Medieval Italy. Three hours of lecture and one hour of discussion per week. (F,SP)
154. Canada. (4)
Three
153. British Empire and Commonwealth. (4)
from exploration and first settlement through colonial times to confederation and nationhood to the present.
155. Medieval Europe. Three hours of lecture and one hour of discussion per week.
155A. From the Late Empire to the Investiture Conflict. (4)
Europe. Three hours of lecture and one hour of discussion per week.
155A. From the Late Empire to the Investiture Conflict. (4)
British Empire and Commonwealth, (4)
153. British Empire and Commonwealth. (4)
Three hours of lecture and one hour of discussion per week. Emphasis on inter- personal and technological sources.
150B. From the Conquest to 1290. (4) Government observation of government, community, religion, and social change.
151. Britain, 1485-Present. Three hours of lecture and one hour of discussion per week. (F,SP)

151A. Tudor Stuart Britain, 1485-1660. (4) The history of Britain, albeit with primary emphasis on England, from the advent of the Tudors through the revolutions of the mid-17th century. Principal concentration on political, religious, and social developments. No prerequisites other than some sense of general European history in the age of the Reformation.

151B. Britain, 1660-1851. (4) This is a course about the history of Britain that asks why this small island nation was so central to how Europeans and others understood world history more generally. It looks at Britain as the paradigmatic venue of industrialization, colonialism, and its absence, consumer culture, parliamentary democracy, religious tolerance, imperial expansion, and modernity generally. It begins with the aftermath of Europe’s first revolution and ends with the French Revolution, 1801’s Great Exhibition. (F,SP)

151C. The Peculiar Modernity of Britain, 1848-2000. (4) For many years, Britain was seen as the crucible of the modern world. This small, cold, and wet island was thought to have been the first to develop representative democracy, an industrial economy, rapid transport, mass media, mass communication and mass culture, and, of course, an empire upon which the sun famously never set. And yet, despite this precocious modernism, Britain remained Britain. The facts of its modernity disguised a broadly “liberal” set of mentalities through which Britons came to understand and manage the great transformations of modern life, both at home and across the empire. (F,SP)

152. Topics in the History of the British Isles. Three hours of lecture and one hour of discussion per week.

152A. Ireland Since the Union. (4) Irish history from the completion of the English conquest (1691) to the present. Topics: the formation of the British colony; the French Revolution and the beginnings of the nationalist tradition; Catholic emancipation and the origins of Home Rule; the Famine of 1845-1847; the development of rural Ireland to the Land League; the transformation of the Catholic unionism, and the Great War; the Irish Revolution; the two Irelands, 1921-1967; Northern Ireland; the Troubles; and the movement for a united Ireland. (F,SP)

153. British Empire and Commonwealth, (4)
Three hours of lecture and one hour of discussion per week.

154. Canada. (4)
Three hours of lecture and one hour of discussion per week. A survey of Canadian history from exploration and first settlement through colonial times to Confederation and nationhood to the present.

155. Medieval Europe. Three hours of lecture and one hour of discussion per week.

155A. From the Late Empire to the Investiture Conflict. (4)
Europe. Three hours of lecture and one hour of discussion per week. This upper division course looks at the rise and fall of the European great powers from the Peace of Westphalia, traditionally perceived as the beginning of the modern states system, to the coming of the First World War, an era of state and empire building. Economic and technological changes are naturally part of this story as well as cultural, social, and political forces. At the same time, the course highlights the decisive influence of the shakers and movers—kings, emperors, and generals.

162B. War and Peace: International Relations since 1914. (4) Three hours of lecture and one hour of discussion per week. This course covers some of the turbulent transitions from the classical European balance of power system to the global multipolar system of today. The course explores the political, economic, ideological, and technological aspects of international affairs. Among topics discussed are the two world wars, inter-war collective security, the Cold War, European integration, imperialism and de-colonization, the cold war, and the present.

163A. European Intellectual History from the Enlightenment to 1870. (4) Three hours of lecture and one hour of discussion per week. Reading primary texts, we will examine the major figures and themes in the intellectual development of Europe from Rousseau to Wagner. Included in the topics of the course will be German Idealism, Romanticism, Utopian Socialism, Marxism, Realism and Nationalism. We will read works by Kant, Hegel, Goethe, Marx, Flaubert, Wolstonecraft, Kierkegaard, and others. We will also listen to Wagner’s Tristan und Isolde. The intellectual and artistic currents of the period will set against the background of European history as a whole. (F,SP)

163B. European Intellectual History, 1870 to the Present. (4) Three hours of lecture and one hour of discussion per week. The focus of the course will be on the social and political thought, primarily in Germany and France, with peripheral attention paid to England and Italy. Related philosophical and cultural trends will also be discussed. The readings will consist largely of selected texts which are representative of the major currents of the period.

164. Modern European Intellectual History. Three hours of lecture and one hour of discussion per week. Formerly 163. Thought and art considered in their social and political contexts. (F,SP)

164A. European Intellectual History from Renaissance to Enlightenment. (4) Between 1500 and 1600, European thought built the foundations of modern culture, politics, economy, government, law, and religion. This course will introduce students to the period from the rediscovery of the Scientific Revolution, from the theological innovation of the Reformation to the new forms of political theory that accompanied both French and American Revolutions.

164B. European Intellectual History from Enlightenment to 1870. (4) Formerly 163A. Reading primary texts, we will examine the major figures and themes in the intellectual development of Europe from Rousseau to Wagner. Included in the topics of the course will be German Idealism, Romanticism, Utopian Socialism, Marxism, Realism, Feminism and Nationalism. We will read works by Kant, Hegel, Goethe, Marx, Flaubert, Wolstonecraft, Kierkegaard, and others. We will also listen to Wagner’s Tristan und Isolde. The intellectual and artistic currents of the period will be set against the background of European history as a whole. (F,SP)

164C. European Intellectual History 1870 to the Present. (4) Formerly 163B. The course will focus on the social and political thought, primarily in Germany and France, with the peripheral attention paid to England and Italy. Related philosophical and cultural trends will also be discussed. The readings will consist largely of selected texts which are representative of the major currents of the period. (F,SP)

165. Topics in Modern European History. Three hours of lecture and one hour of discussion per week.
165. Three hours of lecture and one hour of discussion per week.

166. Modern Germany. Three hours of lecture and one hour of discussion per week.

167. Modern Germany. Three hours of lecture and one hour of discussion per week.

168. Spain and Portugal. Three hours of lecture and one hour of discussion per week.

169. Renaissance and Baroque Italy 1350-1800. (4) Formerly 166B. This course will focus on the history of Italy during a period when it was the leading center of European artistic and cultural production and the driving force in the revival of classical learning and literary humanism. This course will include the work of Raphael, Michelangelo, Ariosto and Alberti, Brunelleschi and Botticelli. At the same time, Italy was also a political battleground through most of this period, both in the realm of ideas and theory but also in a literal sense. It was in Italy that "the art of war," as Machiavelli called it, took center stage as the peninsula became one of the major theaters of war between the great powers of the age, France and Spain. The course will combine a study of the artistic, intellectual, religious, and political history of Italy in this period both as it developed internally and as it was related to the rest of Europe and the Mediterranean world. Requirements will include a mid-term examination and a paper. (F,SP)

170. The Netherlands. (4) Three hours of lecture and one hour of discussion per week. The Lowlands from the earliest times to the present monarchy; emphasis on the Golden Age of the 17th and 18th Centuries.

171. Russia. Three hours of lecture and one hour of discussion per week. Russia 1700 to 1740. (4) This course examines the forces that molded Russian culture, society, and politics from earliest times to the 18th century. Lectures and readings touch upon multiple disciplines, including politics, society, economics, art, architecture, religion, and literature.

172. Russian Intellectual History. (4) Formerly the Russian Revolution, 1721-1917. This course will trace the development of ideas within the Russian empire, taking as its period of study the age, France and Spain. The course will combine a study of the artistic, intellectual, religious, and political history of Italy in this period both as it developed internally and as it was related to the rest of Europe and the Mediterranean world. Requirements will include a mid-term examination and a paper. (F,SP)

173. History of Eastern Europe. From 1900 to the Present. (4) This course will examine the history of 20th-century Eastern Europe, understood as the band of peoples stretching from the Balkans to Poland, and the Balkans, Poland, Czechoslovakia, and Hungary, however, will receive special attention. Topics of study include the development of the nation states, Eastern European nationalism, Nazi occupation, fascist, socialist, the fate of reform communist, reconstitution of "civil society," and the emergence of a new Eastern Europe. Given the paucity of historical written on this region, the course will make extensive use of cinema and literary portrayals of Eastern Europe. (F,SP)

174. Topics in the History of Eastern Europe. Three hours of lecture and one hour of discussion per week. (F,SP)

175A. Jewish Civilization: Middle Ages. (4) Three hours of lecture and one hour of discussion per week. This is the third course in a four-course sequence in the history of Jewish civilization. It focuses on the Middle Ages and the early modern period, including kabbalah, medieval poetry, halachic, ethical literature, Jewish philosophy, and the Italian-Jewish renaissance. Staff

175B. Jewish Civilization: Modern Period. (4) Three hours of lecture and one hour of discussion per week. This is the fourth course in a four-course sequence in the history of Jewish culture and civilization. It explores the major themes in Jewish history from 1750 to the present, with special attention paid to the transformation of Jewish communal and individual identity in the modern world. Topics to be treated include the breakdown of traditional society, enlightenment and emancipation, Zionism, Hasidism, racial anti-Semitism, colonialism, Zionism, and contemporary Jewish life in Europe, North America, and Israel. The multicultural nature of Jewish history is highlighted through the course through the treatment of non-European Jewish narratives alongside the more familiar Ashkenazi perspective. Also listed as Undergrad Interdisciplinary Studies C155 and Religious Studies C135. Staff

176. Multicultural Europe. (4) Three hours of lecture and one hour of discussion per week. This course will track some of the substantive changes and transformations taking place in contemporary Europe in the areas of culture, society, and politics. In particular, we will look at the effects of large population movements due to globalization processes—on the national culture of the core countries and examine the ways in which particular national cultures react to the increasing multiculturalization of
Europe. The goal of the course is, first of all, to familiarize students with a variety of cultural, social, and political innovations that accompanied the formation of modern Europe. This involves: (1) an examination of the traditional concepts of nationhood and citizenship and (2) a study of the Europeanization of culture. Also listed as Geography C152, Interdisciplinary Study of International Maj C145, and International and Area Studies C145.

177. Armenia. Three hours of lecture and one hour of discussion per week. (F,SP)

177A. Armenia from Ethnogenesis to the Dark Ages. (4) This course will cover close to three millennia of Armenian history, from the process of ethnogenesis to the first complete destruction of the Armenian "feudal" system by the end of the 15th century. This course is based on the broad framework of Armenian political history and institutions, but also emphasizes economic development, social change, and cultural transformations. (F,SP)

177B. From Pre-Modern Empires to the Present. (4) This survey course will cover the period from the incorporation of most of the Armenian plateau into the Ottoman Empire to the present day. (F,SP)

178. History of the Holocaust. (4) Three hours of lecture and one hour of discussion per week. This course will examine the historical events and intellectual developments leading up to and surrounding the destruction of European Jewry during World War II. We will examine the Shoah (the Hebrew word for the Holocaust) in the context of the broader backdrop of modern Jewish and modern German history. The course is divided into two main parts: (1) the historical background up to 1939; and (2) the destruction of European Jewry, 1939-1945. (F,SP)

180. The Life Sciences Since 1750. (4) Three hours of lecture and one to two hours of discussion per week. This course will survey the development of the sciences of living nature from the mid-18th to the late-19th century. Topics include scientific and popular narratives of scientific discovery, Darwinian evolution, cell theory, the organizational transformation of science, physiology and experimentalism, classism and molecular genetics, and the biomedical-industrial complex. Emphasis is on the formation of fundamental concepts and methods, long-term trends toward specialization, institutionalization, professionalization, and industrialization, and the place of the life sciences in modern societies. Many lectures are illustrated by slides.

181. Topics in the History of the Physical Sciences. Three hours of lecture and one hour of discussion per week.

181A. Astronomy and Astrology in Medieval and Early Modern Europe. (4) Prerequisites: Strong grasp of plane geometry.

181B. Modern Physics: From the Atom to Big Science. (4) This course examines the establishment of the ideas and institutions of modern physics over the last century and a half. We begin with the 19th-century organization of the discipline and the debates over the classical world picture (mechanics, electromagnetism and optics, thermodynamics and statistical mechanics). We then follow the dramatic changes that undid the classical picture, from the discovery of radiation to Einstein's theory of relativity, and from the quantum revolution to the quantum mechanical model of the atom. (F,SP)

182. Topics in the History of Technology. Three hours of lecture and one hour of discussion per week. (F,SP)

182A. Technology and Society. (4) What drives technological change? How does technology transfer across different cultures? These and other related questions are examined using historical case studies of productive, military, domestic, information, and biomedical technologies from 1700 to the present.

182B. From Pre-Modern Empires to the Present. (4) This course examines the establishment of the first modern nation-states. (F,SP)

182AT. Technology and Society (Cal Teach). (4) This course is a parallel course to 182A, intended for students interested in secondary school science and math. Students in the T course will attend the regular 182A lectures and a special section; this section will focus on techniques, skills, and personal experiences. (F,SP)

183. Topics in the History of Medicine. (4) Three hours of lecture and one hour of discussion per week. (F,SP)

183A. Health and Disease. (4) Three hours of lecture and one hour of discussion per week. (F,SP)

183B. From Pre-Modern Empires to the Present. (4) This course introduces major themes in the history of medicine through the lens of disease. It focuses on two questions: How have they responded to illness? Themes considered include changing theories of disease causality, the development of international public health policy, social understandings of the growth of the pharmaceutical industry. Disease case studies will be analyzed through readings and films. (F,SP)

185. History of Christianity. Three hours of lecture and one hour of discussion per week. Christianity as a cultural, social, and political force in world history and its response to cultural, social, and political change. (F,SP)

185A. History of Christianity to 1250. (4) This course deals with the origins of Christianity and the first eleven centuries of its expansion into a major institutional, social, and intellectual force shaping Western Europe. The course will be concerned with topics and conditions shaping this expansion, rather than a chronological account in order to present this process as a model of institutionalization of religious movements. The emphasis will be on patterns of crisis and reform; i.e., on conflicts arising within the church itself and as a result of its dealings with the "outside" world, and how these crises were resolved. The course is based on the study of primary sources and will include problems of historical method. (F,SP)

185B. History of Christianity from 1250. (4) This course follows 185A as the second of two semesters on the History of Christianity. It treats the history of (principally Western) Christianity from the High Middle Ages to the present in Europe and the Mediterranean area. The course's main theme is the encounter of cultures. Its core readings range from Thomas a Kempis, Martin Luther, and St. Teresa of Avila to Simone Weil and Dietrich Bonhoeffer. The lectures will treat social, cultural, and intellectual topics, such as ecclesiastical authority institutions, forms of piety, revivalism, evangelization, theological speculation, Biblical scholarship, and philosophical arguments for and against religion. This introductory course presupposes no previous study of the subject, though almost any previous study of history or religion should be helpful. (F,SP)

186. International and Global History Since 1945. (4) Three hours of lecture and one hour of discussion per week. This course explores great and complex historical changes that have taken place since the end of World War II. By situating the major historical events in the context of World War II, from population growth to environmental degradation; from globalization to the endurance of economic inequalities—in both comparative and international contexts, this course provides an overview of the origins of our own times and dilemmas in their proper historical context and provides an introduction to recent international and global history. (F,SP)

187. The History and Practice of Human Rights. (4) Students will receive no credit for C187 after taking Letters and Science 140D. Three hours of lecture and one hour of discussion per week. A required class for students in the human rights minor (but open to all) will require the development of a human rights essay. More than a history of origins, it explores the relationships between human rights and other crucial themes in the history of the modern era. As a human rights requirements course and an examination of specific practices, it will ask students to make comparisons across space and time and to reflect upon the evolution of human rights in both thought and action. Also listed as Letters and Science C140V. (F,SP) Sargent

C191. Death, Dying, and Modern Medicine: Historical and Contemporary Perspectives. (4) Three hours of lecture and two hours of discussion per week. This course will study the end of life—dying and death—from the perspective of medicine and history. It seeks to confront the humanist with the quotidian dilemmas of modern clinical practice and medicine’s deep engagement with death more generally. It invites students to discover the ways in which the modern experience of dying and death have been understood and changing. Also listed as Undergraduate Interdisciplinary Studies C133 and Health and Medical Sciences C133. (SP) Laqueur, Micco

C192. History of Information. (3) Upper level undergraduates. Three hours of lecture per week. This course explores the history of information and associated technologies, uncovering why we think of our current information age as it is. It offers an overview of the evolution of production, recording, and storage from the earliest writing systems to the world of short message service (SMS) and blogs. In every instance, we’ll be concerned with both what and why, and we will keep returning to the question of technological determinism: how do technological developments affect society and vice versa? Also listed as Media Studies C104C, Information C103, and Cognitive Science C103. (F,SP) Duguid, Nunberg

C193. Rhetoric, Culture, and Society. (4) Three hours of lecture per week. Prerequisites: Rhetoric 10 or consent of instructor. Analyzes of rhetorical practice in the context of social and cultural change with particular reference to the history of communication from pre-industrial to industrial society in the West. Also listed as Rhetoric C132. (F,SP)

C194. Dutch Culture and Society: Amsterdam and Berkeley in the ’60s. (4) Three hours of lecture and two hours of discussion per week. This course will focus on the cultural aspects of protest- and youth cultures in two cities that were influential in the ’60s: Amsterdam and Berkeley. Particular attention will be paid to how American popular culture was perceived in Amsterdam and vice versa. Also listed in English. Also listed as Sociology C189 and Dutch C170. (F,SP)

H195. Senior Honors. (4) Independent. Prerequisites: Senior honors standing. Limited to senior honors candidates. (r, or consent of instructor) includes a public presentation on the senior honors thesis. Supervisors will be assigned to each student after consultation with the honors committee.

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours of work per semester plus regular meetings with the faculty supervisor. Students work in selected internship programs approved in advance by the faculty coordinator, and for which written contracts have been established between the sponsoring organization and the student. Students will be expected to produce two progress reports for their faculty coordinator during the course of the internship, as well as a final paper for the course. Others with similar interests may also apply; see faculty adviser. Also listed as Gender and Women’s Studies C196W, History of Art C196W, Undergraduate Interdisciplinary Studies C196W, English C196W, Political Economy C196W, and Media Studies C196W.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Independent study...
dent. Must be taken on a passed/not passed basis. Prerequisites: Enrollment is restricted by regulations (F,SP)

Graduate Courses

200X. Special Topics: Short Course. (2) Course may be repeated for credit. Four hours of lecture/seminar per week. A four-week long course permitting the instructor to cover in depth a topic of particular interest. Topics and instructors vary; consult department catalog for details.

200Y. The Book as Object: the Art and Material History of the Book. (2) Course may be repeated for credit. Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. For 2,500+ students, the book has dominated world culture as the primary material object. Lectures and demonstrations devoted to various aspects of the production of manuscript and printed books focusing on examining books in the collection of the Bancroft Library that exemplify, encapsulate, or represent an archetype or excellent model of the type and period(s) in which the book was published. Particular attention will be paid to the art of the book in relation to its content. (F,SP)

275. Core Courses in the Literature of the Several Fields of History. Course may be repeated for credit. Three hours of seminar per week. To provide a broad and survey of the literature and historiographical problems of the different fields in history.

275A. Ancient. (4)
275B. Europe. (4)
275C. England. (4)
275D. United States. (4)
275E. Latin America. (4)
275F. Asia. (4)
275S. History of Science. (4)

280. Advanced Studies: Sources/Generic Literature of the Several Fields. Course may be repeated for credit. Three hours of seminar per week. For pre-course schedule of offerings, see department catalog during pre-enrollment week each semester.

280A. Ancient. (4)
280B. Europe. (4)
280C. England. (4)
280D. United States. (4)
280E. Latin America. (4)
280F. Asia (For M.A. Candidates). (4)
280G. Asia (For Ph.D. Candidates). (4)
280H. Africa. (4)
280N. Canada. (4)
280S. History of Science. (4)
280U. Studies in Comparative History. (4)

281. Paleography and Other Auxiliary Sciences. (4) Course may be repeated for credit with different instructor. Three hours of seminar per week. Introduction to the scholarly handling of texts, whether ancient or modern, inscriptions or manuscripts, and instruction in the methods, tools, sources, and the editing and use of texts relevant to a particular field of history; instruction in any auxiliary science required to understand the learning process of their students, and to develop and improve their own teaching skills. The course will have two primary goals: (1) to train graduate students to work more effectively as graduate student instructors in history classes at Berkeley and (2) to introduce students to techniques of design and running their own classes that they will use when they become independent instructors and, ultimately, professors of history in their own right. (F,SP)

285. Research Seminars. Three hours of seminar per week. For precise schedule of offerings, see department catalog during pre-enrollment week each semester.

285A. Ancient. (4)
285B. Europe. (4)
285C. England. (4)
285D. United States. (4)
285E. Latin America. (4)
285F. Asia. (4)
285H. Africa. (4)
285L. Legal History. (4)
285S. History of Science. (4)
285U. Studies in Comparative History. (4)

290. Historical Colloquium. (1) Course may be repeated for credit. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Colloquium on topics of current research. For precise schedule of offerings, see department catalog during pre-enrollment week each semester. (F,SP)

295. Supervised Research Colloquium. (2-5) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Consent of instructor. Preparation, presentation and criticism of research papers.

296. Directed Dissertation Research. (3-12) Course may be repeated for credit. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to qualified students directly engaged upon the doctoral dissertation. (F,SP)

298. Independent Study for Graduate Students in History. (2-12) Course may be repeated for credit. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor.

299. Directed Reading. (2-12) Course may be repeated for credit. Independent. Prerequisites: Consent of instructor. Individual conferences to be arranged. Intended to provide directed reading in subject matter not covered in scheduled seminar offerings. (F,SP)

301. Individual Study for Master's Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for master's degree. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for M.A. degree. Individual study, in consultation with the graduate adviser, to prepare students for language examinations and the master's examination.

302. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Independent. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Independent study, in consultation with the graduate adviser, to prepare students for language examinations and the doctoral examination. (F,SP)

Professional Courses

300. Teaching History at the University. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This class will introduce graduate students to a variety of techniques and theories used in teaching history at the university level. It will examine readings dealing with a range of classroom situations, and teaching practices that have been developed to help future college teachers of history to understand the learning process of their students and to develop and improve their own teaching skills. The course will have two primary goals: (1) to train graduate students to work more effectively as graduate student instructors in history classes at Berkeley and (2) to introduce students to techniques of designing and running their own classes that they will use when they become independent instructors and, ultimately, professors of history in their own right. (F,SP)

Industrial Engineering and Operations Research

Department Office: 4135 Etcheverry Hall #1777, (510) 643-5484 ioor.berkeley.edu
Chair: Rhonda Righter, Ph.D.

Professor
Richard M. Karp, Ph.D. Harvard University. Theoretical computer science, algorithms

Ilan Adler, Ph.D. Stanford University. Mathematical programming
Alper Atamturk, Ph.D. Georgia Institute of Technology. Polyhedral combinatorics, integer programming
Laurent El Ghaoui, Ph.D. Stanford University. Convex optimization, decision making, robust optimization, bioinformatics
Kenneth V. Goldberg, Ph.D. Carnegie Mellon University. Robotics and geometric algorithms
Dori S. Hochbaum, Ph.D. University of Pennsylvania. Combinatorial optimization, management information systems

Philip M. Kaminsky, Ph.D. Northwestern University. Modeling and analysis of production and logistics systems
Robert C. Leachman, Ph.D. University of California, Berkeley. Manufacturing management

Christos H. Papadimitriou (The C. Lester Hogan Professor in Electrical Engineering and Computer Sciences), Ph.D. University of California, Berkeley. Stochastic modeling and optimization, telecommunications, service operations

Lee W. Schruben, Ph.D. Yale University. Computer simulation

Zuo-Jun (Max) Shen, Ph.D. Northwestern University. Integrated supply chain design, mechanism design, design and analysis of optimization algorithms

Graduate Students

Ying Ju Chen, Ph.D. New York University. Operations research studies. Industrial engineering, requires well-developed integrative skills

Associate Professors

Xin Guo, Ph.D. Rutgers University. Stochastic processes and applications, financial engineering

Andrew E. B. Lim, Ph.D. Australian National University. Financial engineering, stochastic control and applied probability

Overview

Industrial engineering and operations research are closely related fields that deal with the design, analysis, and control of complex systems that include people, machines, material, and information, and the interactions of such systems with their environment. Formal models, often computer-based, are extensively used in systems analysis, while systems design, as in other fields of engineering, requires well-developed integrative skills and creativity. The theoretical foundations of optimization, stochastic systems, reliability, and engineering economics often form the basis for research and teaching. Industrial engineering frequently uses knowledge of production, human/machine systems, incentives, organizational behavior, and automation in the design and improvement of goal-seeking systems. These methods may be applied to a great variety of human activities in both public and private sectors, including manufacturing, banking, health care, communicaitons, waste management, transportation, and logistics.

For more information, see the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study at University of California, Berkeley college-of-engineering-announcement.
Undergraduate Program

Undergraduates in the Department of Industrial Engineering and Operations Research receive broad training in engineering fundamentals, principles of economics and advanced mathematics and statistics in order to prepare them for elective sequences that stress the construction of systems models, the role of the human being in these systems, and the related mathematical and computer methods of optimization and control. A unified core program is offered both for students who wish to pursue the professional aspects of the field, and for those who, after further education at the graduate level, wish to engage in teaching and research. In order to satisfy the needs of students with diverse interests, considerable flexibility is allowed in planning individual programs is provided.

The B.S. program is accredited in industrial engineering and operations research by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 North Wacker Drive, Suite 1050, Chicago, IL, 60606-3111; (312) 642-7500.

Students interested in industrial engineering and operations research may also be interested in the operations research and management science major in the Lattes & Science section. See the Operations Research and Management Science section of this catalog for more information.

Curriculum and Requirements for the Bachelor’s Degree

Students must complete a minimum of 120 units, in which they must satisfy the University of California and Berkeley campus requirements outlined in this catalog. In addition, students must complete the requirements for the College of Engineering and the industrial engineering and operations research program. Full details on these requirements can be found in the College of Engineering Academic Programs: A Guide to Undergraduate and Graduate Study available at coe.berkeley.edu/college-of-engineering-announcement.

Graduate Programs

Graduate programs are offered leading to the M.S. or Ph.D.

The programs have been developed to meet the needs of individuals with backgrounds in engineering or the mathematical sciences who wish to enhance their knowledge of the theory, development, and applications of quantitative models for the analysis, design, and optimization of complex systems in the industrial, service, or public sectors. Students may concentrate on theoretical studies in preparation for doctoral-level research, or on applications of state-of-the-art techniques to real world problems.

Undergraduates from scientific disciplines other than engineering may be accepted into these programs. A master’s degree may be earned by thesis or by comprehensive examination. Doctoral degrees require oral examination in the major and minor fields as well as a robotics laboratory are available for graduate research.

The department requires all graduate applicants to submit scores of the general Graduate Record Examination (GRE). Information on graduate programs may be obtained from the Department of Industrial Engineering and Operations Research, 4141 Etcheverry Hall, Berkeley, CA 94720-1777, and in the Student Services Office, 4141 Etcheverry Hall, Berkeley, CA 94720-1777.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: 161, 165, 172 or Statistics 134. Freshman seminars are offered in all campuses of the university and given in department to department and from semester to semester. (F) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. Prerequisites: 161, 165. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (SP) Ross

Upper Division Courses

115. Industrial and Commercial Data Systems. (3) Two hours of lecture and two hours of laboratory/project per week. Prerequisites: Engineering 7 or 77 and upper division standing. Design and implementation of databases, with an emphasis on industrial and commercial applications. Relational algebra, SQL, normalization, and the creation of data models in teams with local companies on a database design project. WWW design and queries. (F) Goldberg

130. Methods of Manufacturing Improvement. (3) Three hours of lecture per week. Prerequisites: 172, Mathematics 54, or Statistics 134 (may be taken concurrently). The improvement of manufacturing performance along the dimensions of productivity, quality, customer service, and throughput. Techniques for yield analysis, process control, inspection system design, statistical analysis of batch size, cycle time reduction, and on-time delivery improvement. Applications on semiconductor manufacturing or other industrial settings. (SP) Leachman

131. Discrete Event Simulation. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 161, 165; 172 or Statistics 134. Introductory course on design, programming, and statistical analysis of a simulation study. Topics include the types of problems that can be solved by such methods. Programming techniques are studied, in addition to random variable generation for a variety of common variables. Techniques to reduce the variance of the resultant estimator and statistical analysis are considered. Final project required. (F) Staff

140. Introduction to Mobile Industrial Robots. (4) Two hours of lecture, two hours of laboratory, and two hours of workshop per week. Prerequisites: Knowledge of Java equivalent to completion of Computer Science 46, Engineering 7 or 77. Introductory course in the hardware and software design of autonomous vehicles. Basic concepts of sensors, actuators, navigation, exploration, feedback control, and communications. Object-oriented programming design principles. Programming for real-time control using Java, Labaratory project teams will design, build, program, and test small prototype vehicles for material handling systems and other applications. (F.SP) Glassy, Goldberg

150. Production Systems Analysis. (3) Three hours of lecture, two hours of laboratory. Prerequisites: 160, 161, 162, 165, and Engineering 120, or senior standing in manufacturing engineering. Quantitative models for operational and tactical decision making in production systems, including production, inventory control, forecasting, and scheduling. (F) Yano

151. Service Operations Design and Analysis. (3) Three hours of lecture per week. Prerequisites: 161, 162, and a course in statistics. This course is concerned with improving processes and designing facilities for service businesses such as banks, health care organizations, telephone call centers, restaurants, and transportation providers. Major topics in the course include design of service processes, layout and location of service facilities, demand forecasting, scheduling, service management, facility layout, service quality management, and capacity planning. (SP) Staff

153. Logistics Network Design and Supply Chain Management. (3) Three hours of lecture per week. Prerequisites: 160, 162 or senior standing. We will focus primarily on both quantitative and qualitative aspects of the entire supply chain. (SP) Goldberg


161. Operations Research II. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 53 and 54. Formulation to linear programs and allocation problems in industrial and environmental studies. Convex sets; properties of optimal solutions. The simplex method; theorems of duality; complementary slackness. Problems of post-optimization: sensitivity; network problems. Digital computation. (F.SP)

165. Engineering Statistics, Quality Control, and Forecasting. (3) Students will receive no credit for 165 after taking Statistics 135. Three hours of lecture per week. Prerequisites: 172 or Statistics 134 or an equivalent course in probability theory. This course will introduce students to basic statistical techniques such as parameter estimation, hypothesis testing, regression analysis, analysis of variance. Specific considerations in forecasting quality control will be considered in detail. (F.SP) Staff

166. Decision Analysis. (3) Three hours of lecture per week. Prerequisites: 172 or Statistics 134. Introductory course on the theory and applications of decision analysis. Elective course that provides a systematic evaluation of decision-making problems under uncertainty. Emphasis on the formulation, analysis, and use of decision-making techniques in engineering, operations research and systems analysis. Includes formulation of risk problems and risky decision making. Graphical methods and computer software using event trees, decision trees, and influence diagrams that focus on model design. (SP) Oren

170. Industrial Design and Human Factors. (3) Three hours of lecture per week. Prerequisites: Upper division standing. This course surveys topics related to the design of products and interfaces ranging from alarm clocks, cell phones, and dashboards to logos, presentations, and websites. Design of such systems requires familiarity with human factors and ergonomics, including the physics and perception of color, sound, and touch, as well as familiarity with case studies and contemporary practices in interface design and usability testing. Students will explore design problems individually and in teams. (SP) Goldberg

171. Introduction to Design of Human Work Systems and Organizations. (3) Students will receive no credit for 171 after taking Undergraduate Business Administration 105. Three hours of lecture per week.

B prefix=language course for business majors
R prefix=course satisfies R&C requirement
W prefix=online course
R prefix=xhonor course
H prefix=course satisfies American Cultures requirement
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
**180. Senior Project.** (4) One hour of lecture, one hour of consultation with faculty advisor, and six hours of company visitation per week. Prerequisites: 131, 160, 161, 162, 165, Engineering 120, and three other industrial and operations research electives. Application of systems analysis and industrial engineering to the planning, and/or design of industrial, service, and government systems. Consideration of economic, technical, and human aspects of equipment and process design. Students work in teams under faculty supervision. Topics vary yearly. (F,SP) Staff

**190. Advanced Topics in Industrial Engineering and Operations Research.** Course may be repeated for credit. One to four hours of seminar per week. Prerequisites: Consent of instructor. The 190 series covers current topics of research interest in industrial engineering and operations research. The course content may vary from semester to semester. Check with the department for current term topics. The 190 series cannot be used to fulfill any engineering requirement (engineering units, courses, technical electives, or otherwise). (F)

**190H. Cases in Global Innovation.** (1) Two hours of lecture per week for eight weeks. Prerequisites: Junior or senior standing. This course is designed primarily for upper-level undergraduate and graduate students interested in examining the major challenges and success factors entrepreneurs and innovators face in globalizing a company, product, or service. The course content exposes students interested in internationally oriented careers to the strategic thinking and decision-making process involved in international engagement and expansion. Cases will include both U.S. companies seeking to enter emerging markets and emerging market companies looking to expand within their own nations or into markets in developed nations. The course is focused around intensive study of actual business situations through rigorous case-study analysis. (F) Siddhu, Staff

**191. Technology Entrepreneurship.** (3) Students will receive no credit for 191 after taking 190A prior to fall 2009. Three hours of lecture per week. Prerequisites: Junior or senior standing. This course explores key entrepreneurial concepts relevant to the high-technology environment. Topics include the entrepreneur's perspective, start-up strategies, business idea evaluation, business plan writing, introduction to entrepreneurial finance and venture capital, managing growth, and management of innovative products. This course prepares technical and business minded students for careers focused on entrepreneurship, intrapreneurship, and high technology. Students undertake intensive study of actual business situations through rigorous case-study analysis. This course can not be used to fulfill any engineering requirement (engineering units, courses, technical electives, or otherwise). (F,SP) Staff

**192. Directed Group Studies for Advanced Undergraduates.** (1-4) Three hours of lecture per week. Prerequisites: 172 or Statistics 134. Students interested in studying a topic of interest should consult the director of undergraduate studies for approval. Each student engaged in a directed group study must present to the group on a regular basis. The director of undergraduate studies will approve or reject the group, and a study plan. (F)

**199. Supervised Independent Study.** (1-4) Pass/fail. Three hours of lecture per week. Prerequisites: Consent of instructor. Supervised independent study. Enrollment restrictions apply. (F,SP) Staff

**215. Analysis and Design of Databases.** (3) Two hours of lecture and one hour of laboratory/project per week. Prerequisites: Graduate standing. Advanced topics in information management, focusing on design of relational databases, querying, and normalization. New issues raised by the Internet. Research projects on current topics in information technology. (F) Goldberg

**220. Economics and Dynamics of Production.** (3) Three hours of lecture per week. Prerequisites: 262A (may be taken concurrently). Mathematics 104 recommended. Analysis of the capacity and efficiency of production systems. Development and application of analytical tools for improving efficiency, customer service, and profitability of production environments. Design and development of effective industrial production planning systems. Modelling principles are illustrated by reviewing actual large-scale planning systems. They are also implemented for naval ship overhaul and for semiconductor manufacturing. (F) Leachman

**221. Introduction to Financial Engineering.** (3) Three hours of lecture per week. Prerequisites: 162 or 262A, course in probability, or consent of instructor. A course on financial concepts useful for engineers that will cover, among other topics, those of interest rates, present values, arbitrage, geometric Brownian motion, and continuous time models. Options pricing, and hedging. The Black-Scholes option-pricing formula will be derived and studied. Stochastic simulation ideas will be introduced and used to obtain the risk-neutral geometric Brownian motion values for certain types of Asian, barrier, and lookback options. Portfolio optimization problems will be considered both from a mean-variance and from a utility function point of view. Methods for evaluating the sensitivity of mathematical optimization models to various parameters are introduced. (F) Oren, Ross

**222. Financial Engineering Systems I.** (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 221 or Statistics 134 or a one-semester probability course. Introductory graduate-level course, focusing on applications of operations research techniques—e.g., probability, statistics, and optimization—to financial engineering. The course starts with a quick review of 221, including no-arbitrage theory, complete market, risk-neutral pricing, and hedging in discrete model, as well as basic probability and statistical tools. It then covers Brownian motion, martingales, and Ito’s calculus, and deals with risk-neutral pricing in continuous time models. Standard topics include Girsanov transformation, martingale representation formula, Black-Scholes formula, and American and exotic option pricing. Simulation techniques will be discussed at the end of the semester, and MATLAB (or C or S-Plus) will be used for computation. (F,SP) Guo

**223. Financial Engineering Systems II.** (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 222 or equivalent, 161 or 263A or equivalent. Advanced graduate course for Ph.D. students interested in pursuing a professional/research career in finance. The course will consist of a quick review of 222: the basics of Brownian motion, martingales, Ito’s calculus, risk-neutral pricing in continuous time models. It then covers rigorously and in depth the most fundamental probability concepts for financial engineers, including stochastic integral, stochastic differential equations, and semi-martingales. The second half of the course will discuss the following topics: Portfolio theory, credit risk and analysis, risk measures and portfolio optimization, and liquidity risk and models. (F,SP) Guo

**C227A. Introduction to Convex Optimization.** (4) Three hours of lecture, one hour of discussion, and two hours of laboratory per week. Prerequisites: Mathematics 54 and Statistics 210A or consent of instructor. Convex optimization is a class of nonlinear optimization problems where the objectives to be minimized, and the constraints, are both convex. Contrary to the more familiar linear programming problems, convex programs often go unrecognized, and this is a pity since a large class of convex optimization problems can now be efficiently solved. In addition, it is possible to approximate non-convex problems (by so-called “combinatorial optimization” problems) using convex approximations that are more efficient than classical linear ones. The course covers some convex optimization in industry and algorithms, and describes various applications arising in engineering design, machine learning and statistics, finance, and operations research. The course includes laboratory assignments, which consist of implementing experiences in Engineering C227A. (F,SP) El Ghaoui, Wainwright

**C227B. Convex Optimization and Approximation.** (3) Three hours of lecture per week. Prerequisites: 227A or Electrical Engineering 227A or C227A or consent of instructor. Convex optimization as a systematic design tool for hard design and approximation problems that arise in engineering. The course starts with a quick review of the fundamentals of combinatorial optimization problems, stochastic programming problems, robust optimization problems (i.e., with optimization problems with unknown but bounded uncertainty), mixed-integer problems. Qualitative estimates of the resulting approximations. Applications in robust engineering design, statistics, control, finance, data mining, operations research, and engineering. Also listed as Electrical Engineering C227B. (F,SP) El Ghaoui

**231. Introduction to Data Modeling, Statistics, and System Simulation.** (3) Three hours of lecture per week. Prerequisites: 262A, 263A or equivalents and some programming experience. This course uses industrial engineering and operations research models for analyzing and optimizing real systems where the underlying processes and/or parameters are not fully known, but data may be available, sampled, or artificially generated. Monte Carlo simulation is used to model systems that may be too complex to approximate accurately with deterministic, stationary, or static models, and to measure the robustness of predictions; to manage the risk, to study, and to test data-driven industrial engineering and operations research models. (F,SP) Staff

**250. Introduction to Production Planning and Logistics Models.** (3) Three hours of lecture per week. Prerequisites: 262A and 263A taken concurrently. This will be an introductory first-year graduate course covering fundamental models in production planning and logistics. Models, algorithms, and analytical techniques for inventory control, production scheduling, production planning, facility location and logistics network design, vehicle routing, and demand forecasting will be discussed. (F) Kaminsky

**251. Facilities Design and Logistics.** (3) Three hours of lecture per week. Prerequisites: 262A and either 172 or Statistics 134. Design and analysis of models and algorithms for facility location, vehicle routing, and facility layout problems. Emphasis will be placed on both the use of computers and the theoretical analysis of models and algorithms. (SP) Kaminsky

**253. Supply Chain Operation and Management.** (3) Three hours of lecture per week. Prerequisites: 262A and either 172 or Statistics 134. Supply chain analysis is the study of quantitative models that characterize various economic trade-offs in the supply chain. The field has seen significant strides on both the theoretical and practical fronts. On the theoretical front, supply chain analysis inspires new research ventures that blend quantitative models with operations research and management science often go unrecognized, and this is a pity since a large class of convex optimization problems can now be efficiently solved. In addition, it is possible to approximate non-convex problems (by so-called “combinatorial optimization” problems) using convex approximations that are more efficient than classical linear ones. The course covers some convex optimization in industry and algorithms, and describes various applications arising in engineering design, machine learning and statistics, finance, and operations research. The course includes laboratory assignments, which consist of implementing experiences in Engineering C227A. (F,SP) El Ghaoui, Wainwright
264. Computational Optimization. (3) Three hours of lecture per week. Prerequisites: 262A (may be taken concurrently). Survey of solution techniques and problems that have formulations in terms of flows in networks, matchings, non-linear programming, convex optimization, linear and integral cost flows. Multiterminal and multicommodity flows. Relationship with linear programming, transportation problems, electrical networks, and critical path scheduling. (SP) Adler, Oren

265. Network Flows and Graphs. (3) Three hours of lecture per week. Prerequisites: 262A (may be taken concurrently). Survey of solution techniques and problems that have formulations in terms of flows in networks, matchings, non-linear programming, convex optimization, linear and integral cost flows. Multiterminal and multicommodity flows. Relationship with linear programming, transportation problems, electrical networks, and critical path scheduling. (SP) Adler, Oren


268. Applied Dynamic Programming. (3) Three hours of lecture per week. Prerequisites: Mathematics 51. Dynamic programming formulation of deterministic decision process problems, application to problems of equipment replacement, resource allocation, scheduling, search and routing. Brief introduction to decision making under uncertainty. (F) Dreyfus

269. Integer Programming and Combinatorial Optimization. (3) Three hours of lecture per week. Prerequisites: 262A. The course deals with discrete optimization problems and their complexity. These topics include complexity analysis of algorithms and its drawbacks; solving a system of linear integer equations and inequalities; strongly polynomial algorithms; network flow problems (including matching and branching); polyhedral optimization; branch and bound and lagrangean relaxation. Hochbaum

280. Systems Analysis and Design Project. (3) Three hours of lecture per week. Prerequisites: 262A, 263A. A project course for students interested in applications of operations research and engineering methods. Topics vary or systems, which may be public or in the private sector, will be selected for detailed analysis and re-designed by student groups. (F,SP) Staff


290C. Statistical Aspects of Discrete Event Simulation. (2) Two hours of lecture and two hours of discussion per week. Prerequisites: 263A and Statistics 200B, or equivalent. Statistical design and analysis of discrete event simulation of stochastic models. Methods of simulating random variables and stochastic processes. Variance estimation; Monte Carlo estimation; the bootstrap and confidence intervals. Variance reduction approaches including control variates, stratified sampling, importance sampling, conditional expectations, and the use of hazard variables will be studied. Ross

290G. Advanced Mathematical Programming. (3) Three hours of lecture per week. Prerequisites: 262A. Selected topics in mathematical programming. The actual subjects covered may include convex analysis, duality theory, convexity, parametric pivot theory, fixed point theory, optimization by vector space methods, advanced topics in nonlinear algorithms, and complexity of mathematical programming algorithms (including linear programming).

290R. Topics in Risk Theory. (3) Three hours of lecture per week. Prerequisites: 262A. Seminar on selected topics from financial and technological risk theory, such as risk modeling, attitudes towards risk and utility theory, portfolio management, gambling and social insurance, and other risk-sharing arrangements, stochastic models of risk generation and run off, risk reserve, Bayesian forecasting and credibility approximations, influence diagrams, decision trees. Topics will vary from year to year.

298. Group Studies, Seminars, or Group Research. (1-4) Course may be repeated for credit. Seminars: Sections 1-4 are graded on a satisfactory/unsatisfactory basis. Sections 5-8 are graded on a letter-grade basis. Advanced seminars in industrial engineering and operations research. (F,SP) Staff

299. Individual Study for Research. (1-2) Course may be repeated for credit. Individual conference. Sections 1-18 are graded on a satisfactory/unsatisfactory basis. Sections 19-36 are graded on a letter-grade basis. Individual investigation of advanced industrial engineering problems. (F,SP) Staff

601. Individual Study for Master’s Students. (1-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study under the direction of the student in consultation with the field adviser. Units may not be used to meet either unit or residence requirements for a master’s degree. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). May not be used for unit or residence requirements for the doctoral degree. (F,SP) Staff
Program Overview

The Graduate Group in Infectious Diseases and Immunity provides opportunity for the study of the biology of infectious agents, their interaction with human and other hosts, and their relationship with the environment. The program is unique in its emphasis on integrated multidisciplinary training in host-pathogen environmental interactions. Important areas of inquiry include the biology of host-pathogen interactions, molecular and cellular aspects of pathogenesis, the ecology and evolution of disease agents, environmental factors in transmission, intermediate hosts and vectors, the biology of surveillance and epidemiological analysis, and vaccine and drug development, and public health practices for disease prevention and control.

The objective of this program is to provide students with research-oriented pursuits that will train them to design and implement independent investigations. The goal is to promote health by integration of basic research and applied technologies for the development of new approaches for the diagnosis, treatment, prevention, and control of infectious disease in humans.

Students matriculating through this program will acquire expertise in fundamental infectious disease research and prepare them for careers in academia, governmental agencies, and biotechnology. For further information, visit microbe.berkeley.edu or the Ph.D. website directly at microbe.berkeley.edu/idg/index.html.

Information

(School of Information)

Office: 102 South Hall, (510) 642-1464
ischool.berkeley.edu
Dean: AnnaLee Saxenian, Ph.D.

Professors
Yale M. Braunstein, Ph.D. Economics of information and communication
John Chiang, Ph.D. Economics-informed design of networked systems
Morten Hanserl, Ph.D. Collaboration, managing innovation, social networks, knowledge transfer, corporate transformation, leadership
Marti Hearst, Ph.D. Human-computer interaction, information visualization, computational linguistics, information retrieval
Ray R. Larson, Ph.D. Information retrieval system design and evaluation
Pamela Samuelson, J.D. Intellectual property law
AnnaLee Saxenian (Dean), Ph.D. Networks, clusters and development in the information economy
J. Douglas Tygar, Ph.D. Computer security and privacy
Nancy A. Van House, Ph.D. Science and technology studies (STS), knowledge communities, user experience research, visual media, visual studies, visual narrative
Steven Weber, M.D., Ph.D. International relations, international business and the information economy
Michael K. Buckland (Emeritus), Ph.D.
Michael D. Cooper (Emeritus), Ph.D.
William Cooper (Emeritus)
Robert Hartlan (Emeritus)
Bill Maron (Emeritus)

Assistant Professors
Jenna Burrell, Ph.D. Technology appropriation in non-Western societies, technology and socio-economic development, qualitative research methods
Brian Carver, J.D. Copyright law, open source and free software, technology and innovation policy
Coye Chesley, M.S. social psychology, social networks and information exchange
Desiree McGuire, Ph.D. Information technology law and policy, privacy, security
Tapan Parikh, Ph.D. UC, CITD, information systems supporting microfinance, smallholder agriculture and public health
Kimiko Ryokai, Ph.D. Human-computer interaction, tangible user interfaces

Adjunct Professors
Paul Duquette, Ph.D. Socio-cultural and community aspects of information, learning and technology
Robert Giubbi, Ph.D. Information-intensive systems and services, electronic environments, information policy, business innovation and entrepreneurship
Clyde Linn Evans, Ph.D. Digital libraries
Geoffrey Nunberg, Ph.D. Language and culture in a digital age
Erik Wilde, Ph.D. Web architecture, information architecture, open services

Ph.D. Program

The doctoral program is a research-oriented program in which the student chooses specific fields of specialization, prepares sufficiently in the literature and the research of those fields to pass a qualifying examination, and completes original research in fulfilling the dissertation requirement. The degree of Doctor of Philosophy is conferred in recognition of a candidate’s grasp of a broad field of learning and distinguished accomplishment in that field through contribution of an original piece of research revealing high critical ability and powers of imagination and synthesis.

Lower Division Courses
24. Freshman Seminar. (1 Course) May be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis; sections 3-4 to be graded on a pass/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars offered in many campus departments; topics vary from department to department and semester to semester. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Freshman and sophomore seminars offered to lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and semester to semester. (F,SP) Staff

98. Directed Group Study for Lower Division Undergraduates. (1-3 Courses) May be repeated for credit. One to four directed group study courses per semester must be taken on a pass/not passed basis. The program is designed for small groups of students interested in topics of interest, varying from semester to semester. (F,SP) Staff

Upper Division Courses

C103. History of Information. (3 Courses) Three hours of lecture per week. Prerequisites: Upper-level undergraduate courses. This course explores the history of information and associated technologies, uncovering why we think of ours as "the information age." We will select moments in the evolution of production, recording, and storage from the earliest writing systems to the latest mobile messaging services and blog entries. In every instance, we’ll be concerned with both what and when and how and why, and we will keep returning to the question of technological determinism: how do technological developments affect the way society and vice versa? Also listed as Media Studies C104C, History C192, and Cognitive Science C103. (F,SP) Rugdug, Nunberg

114. User Experience Research. (3 Course) Students will receive no credit for 114 after taking 214. Three hours of lecture per week. Methods and concepts of creating design requirements and evaluating prototypes and existing systems. Emphasis on computer-based systems, including mobile system and ubiquitous computing. May be suitable for students interested in other domains of design for end-users. Includes quantitative and qualitative methods as applied to design, usually for short-term term studies intended to provide feedback to designers. (F,SP) Staff

141. Search Engines: Technology, Society, and Business. (2 Hours of lecture and one hour of discussion per week. In this course, students will first gain an understanding of the basics of how search engines work, and then explore how search engine design impacts business and culture. Topics include search advertising and auctions, search and privacy, search ranking, internationalization, anti-spam efforts, local search, peer-to-peer search, and search of blogs and other communities. Open to all undergraduate students and designed for those with little technical background. (F,SP) Staff

146. Foundations of New Media. (3 Hours of lecture per week. Prerequisites: No prior New Media production experience required. Introduction to interdisciplinary study and design of new media. Survey of theoretical and practical foundations of new media including theory and history; analysis and reception; computational foundations; social implications; interaction design; visual, physical, and tangible design. Instruct course combines lectures and project-based learning using case studies from everyday technology (e.g., telephone, camera, web). (F,SP) Staff

152. Mobile Application Design and Development. (3 Hours of lecture per week. Prerequisites:
Introductory programming experience. This course looks at the quickly developing landscape of mobile applications. It focuses on web-based mobile applications, and thus covers issues of web-service design (RESTful service design), mobile platforms (iPhone, Android, Symbian/S60, WebOS, Windows Mobile, BlackBerry OS, BREW, JavaME/JavaFX, Flash Light), and associated object-oriented concepts and requirements of user interface design for limited devices. The course combines a conceptual overview, design issues, and practical development issues. (F,SP) Staff

153. Web Architecture and Information Management. (3) Students will receive no credit for 153 after taking 202. Prerequisites: 206 or equivalent. Introduction to high-level programming languages with emphasis on strings, models, data structures, object-oriented programming. Use of the PYTHON language. (F,SP) Staff

181. Technology and Poverty. (3) Students will receive no credit for 181 for 190-01 Technology and Poverty. Three hours of lecture per week. This course provides students to think broadly about the interplay between technological systems, social processes, economic activities, and political contingencies in efforts to alleviate poverty. Students will consider radicalism and poverty not only in terms of high-level indicators, but from a ground-level perspective as ‘the poor’ experience and describe it for themselves. The role played by individuals and societies of the developing world as active agents in processes of technology adoption and use will be a central theme. (SP) Burrell

190. Special Topics in Information. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Novo-natur focusing on topics of current interest. Topics vary. A seminar paper will be required. Open to students from other departments. (F,SP) Staff

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Meetings to be arranged. Must be taken on a pass/no pass basis. Prerequisites: Consent of instructor. (F,SP) Staff

199. Individual Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a pass/no pass basis. Open to students from other departments. (F,SP) Staff

202. Information Organization and Retrieval. (4) Three hours of lecture per week. Organization, representation, and access to information. Categorization, indexing, and content analysis. Database design and maintenance of databases, indexes, classification schemes, and thesauri. Use of codes, formats, and standards. Analysis and evaluation of search and navigation techniques. (F) Staff

203. Social and Organizational Issues of Information. (3) Three hours of lecture per week. Prerequisites: Consent of instructor required for non-majors. The relationship between information and information systems, technology, practices, and artifacts on how people organize their work, interact, and understand experience. Individual, group, organizational, and societal issues in information production and use, information systems design and management, and information and communication technologies. Social science research methods for understanding information issues. (F,SP) Cheshire

205. Information Law and Policy. (3) Two hours of lecture per week. Course must be completed for a letter grade to fulfill degree requirements. Prerequisites: Consent of instructor required for non-majors. Law is one of the most important technologies of our time. Regulation and issues of tension between free flow and restrictions on the flow of information. This course introduces students to copyright and other forms of legal protection for information in conjunction with technology, and the tension, liability for insecure systems and defective information, privacy, and national and international information policy. (F,SP) Mulligan

206. Distributed Computing Applications and Infrastructure. (4) Course must be completed for a letter grade to fulfill degree requirements. Three hours of lecture and one hour of laboratory per week. Prerequisites: Introduction to high-level programming course and consent of instructor for non-majors. The course provides an overview of the Web as an information system, and how it is used for information management for personal and shared information. The Web is an open and constantly evolving system which can make it hard to understand how the different parts of the landscape fit together. This course provides students with an overview of the Web as a whole, and how the individual parts fit together. It provides students with the understanding and skills to better navigate and use the landscape of Web information. (F,SP) Staff

211. Group and Organizational Approaches to Information Systems Use. (3) Three hours of lecture per week. Prerequisites: 203 or consent of instructor. As information and information systems have become strategic, information workers at all levels in all environments must demonstrate higher levels of professionalism, not only to perform their duties competently, but to remain competitive in the job market. This course, in conjunction with the School of Information final project, gives students insight into the sources and best practice of professionalism, and gives students the chance to refine their skills in simulated but realistic working environment. (F,SP) Staff

216. Computer-Mediated Communication. (3) Three hours of lecture per week. This course covers the theoretical and practical issues associated with computer-mediated communication (CMC) systems (e.g., e-mail, newsgroups, wikis, online games, etc.). We will focus on the analysis of CMC practices, the relationship between technical and behavioral design and implementation issues associated with constructing CMC systems. This course primarily takes a social scientific approach (including research from sociology, anthropology, economics, sociology, and communication). (F) Cheshire

221. Information Policy. (3) Three hours of lecture per week. Prerequisites: 206 or consent of instructor. Policy and technical issues related to insuring the accuracy and privacy of information. Encoding and decoding techniques including public and private key encryption; privacy and security problems in networked information environments including viruses, worms, trojan horses, Internet address spoofing. (SP) Tygar

228. Information Systems and Service Design. (3) Three hours of lecture per week. An examination of the nature of corporate, nonprofit, and governmental information policy. The appropriate role of the government in production and dissemination of information, the tension between privacy and freedom of access to information. Issues of potential conflicts in values and priorities in information policy. (SP) Braustein

229. Managing in Information-Intensive Companies. (3) Students will receive no credit for 229 after taking 290, Section 1 (Spring 2009) or Section 6 (Fall 2009) in the same quarter. This course focuses on managing people in information-intensive firms and industries, such as information technology industries. Topics include managing knowledge work, digital technologies, collaborating across disparate units, giving and receiving feedback; managing the innovation process (including in eco-systems); managing through networks; and managing when using communication tools (e.g., telepresence). The course relies heavily on cases as a pedagogical form. (F,SP) Hansen

228. Information Systems and Service Design. (3) Students will receive no credit for 228 after taking 290, Section 1 (Spring 2009) or Section 6 (Fall 2009). Three hours of lecture per week. This course focuses on managing people in information-intensive firms and industries, such as information technology industries. Topics include managing knowledge work, digital technologies, collaborating across disparate units, giving and receiving feedback; managing the innovation process (including in eco-systems); managing through networks; and managing when using communication tools (e.g., telepresence). The course relies heavily on cases as a pedagogical form. (F,SP) Hansen
law including intellectual property, trans-border data flow, privacy, libel, and constitutional rights. (SP) Carver

237. Intellectual Property Law for the Information Industries. (3) Three hours of lecture per week. Prerequisites: 205 or consent of instructor. The philosophical, legal, historical, and economic aspects of the need for and uses of laws protecting intellectual property. Topics include types of intellectual property (copyright, patent, trade secrecy), the interaction between copyright and the public domain, and the licensing of intellectual property (including compulsory licensing), and the relationship between intellectual property and compatibility standards. (SP) Carver


242. XML Foundations. (3) Three hours of lecture per week. Prerequisites: 202 or consent of instructor. The design and presentation of digital information. Use of graphics, animation, sound, visualization software to text-processing problems. (F,SP) Hearst

245. Organization of Information in Collections. (3) Three hours of lecture per week. Prerequisites: 202 or consent of instructor. Concepts and methods of design, management, creation, and evaluation of multimedia information systems. Use of graphics, animation, sound, visualization software, and hypermedia in presenting information to the user. Methods of presenting complex information to enhance comprehension and analysis. Incorporation of visualization techniques into human-computer interfaces. (F) Larson

246. Multimedia Information. (3) Three hours of lecture per week. Prerequisites: 202, 203, or consent of instructor. Theories and methods of design, production, reception, organization, retrieval, and reuse. Review of applicable digital technology with special emphasis on digital video. Course will involve group projects in design and development of digital media systems and applications. (SP) Larson

247. Information Visualization and Presentation. (3) Three hours of lecture per week. Prerequisites: 213, Computer Science 160, or consent of instructor. The design and presentation of digital information. Use of graphics, animation, sound, visualization software, and hypermedia in presenting information to the user. Methods of presenting complex information to enhance comprehension and analysis. Incorporation of visualization techniques into human-computer interfaces. (SP) Larson

250. Computer-Based Communications Systems and Networks. (3) Three hours of lecture per week. Prerequisites: 206 or equivalent. Communications concepts, protocols, and standards in modern communications systems. Topics include network architectures, communication protocols, network protocols, network management, and distributed information systems. Policy and management implications of the technology. (F) Chuaung

252. Mobile Application Design and Development. (3) Three hours of lecture per week. Prerequisites: 206 or consent of instructor. This course will cover the development of mobile applications. Topics include user interface design, mobile platforms (iPhone, Android, Symbian/S60, BlackBerry OS, BREW, JavaME/J2ME, Flash Lite), and the specific constraints and requirements of user interface design for limited devices. The course combines a conceptual overview, design issues, and practical development issues. (F,SP) Staff

256. Applied Natural Language Processing. (3) Three hours of lecture per week. Prerequisites: 255, a computer science background, or equivalent. This course explores the state-of-the-art in applied Natural Language Processing (also known as content analysis and information extraction). Focus will be on how well existing algorithms perform and how they can be used (or not) in applications. Topics include part-of-speech tagging, shallow parsing, text classification, information extraction and classification, and ontologies into text analysis, and question answering. Students will apply and extend existing software tools to text-processing problems. (F,SP) Hearst

257. Database Management. (3) Three hours of lecture per week. Introduction to relational, hierarchical, and network-oriented database management systems. Database design concepts, query languages for database applications (such as SQL), concurrency control, recovery techniques, database security. Issues in the management of databases. Use of report writers, application generators, high-level interface generators. (SP) Larson

262. Theory and Practice of Tangible User Interfaces. (4) Students will receive no credit for C262 if taking lecture per week for half a year or one hour of laboratory per week. This course explores the theory and practice of Tangible User Interfaces, a new approach to human-computer interaction that focuses on the physical interaction with digital entities. The course includes the theoretical framework, design examples, enabling technologies, and evaluation of Tangible User Interfaces. Students will design and develop experimental Tangible User Interfaces using physical computing prototyping tools and write a final project report. Also listed as New Media C262. (F) Ryokai

265. Interface Aesthetics. (2) Students will receive no credit for C265 after taking 290, Section 1 (spring 2009) or New Media 290, Section 2 (fall 2010). Three hours of lecture per week. This course will cover new interface metaphors beyond desktops (e.g., for mobile devices, computationally enhanced environments, tangible user interfaces) but will also cover visual design basics (e.g., color, layout, typography, iconography), so we have systematic and critical understanding of visual design. Students will get a hands-on learning experience on these topics through course projects, design critiques, and discussions, in addition to lectures and readings. Also listed as New Media C265. (F,SP) Ryokai

271A. Quantitative Research Methods for Information Systems. (3) Three hours of lecture per week. Quantitative methods for data collection and analysis. Research design. Conceptualization, operationalization, measurement. Modes of data collection, including experiments, survey research, observation, Sampling, basics of data analysis. (F) Tygar

271B. Quantitative Research Methods for Information Systems and Management. (3) Three hours of lecture per week. Quantitative research methods for investigating research problems in the information systems discipline. Emphasis on understanding and interpreting the statistical methods used in research articles. (SP) Cheshire


283. Information and Communications Technology for Development. (3) Students will receive no credit for C283 after taking 290, Section 17. Three hours of seminar per week. This seminar reviews current literature and debates regarding Information and Communication Technology and Development (ICTD). This is an interdisciplinary and practice-oriented course that draws on insights from economics, sociology, engineering, computer science, management, public health, etc. Also listed as Energy and Resources Group C283. (SP) Ray, Saxenian

287. Information and Communications Technologies for Social Environments. (3) Students will receive no credit for C287 after taking 290, Section 7 (fall 2009 or fall 2010). Three hours of lecture per week. This course is focused on the creation of sustainable enterprises based on Information and Communications Technologies (ICT) innovations supporting international development. We take a broad view of entrepreneurship—including starting new businesses, non-profit initiatives, and/or public sector projects. We will take a highly iterative, design-oriented, feedback-driven approach to developing and refining business plans for social enterprises. (F) Parikh

290. Special Topics in Information. (1-4) Course may be repeated for credit as topic varies. Two to six hours of lecture per week for one to four hours of lecture per week for 15 weeks. Prerequisites: Consent of instructor. Specific topics, hours, and credit may vary from section to section, year to year. (F,SP) Staff

290A. Special Topics in Information. (1,2) Course may be repeated for credit. One and one-half to two hours of lecture per week for eight weeks. Two hours of lecture per week for six weeks. Three hours of lecture per week for five weeks. Prerequisites: Consent of instructor. (F,SP) Staff

295. Doctoral Colloquium. (1) One hour of colloquia per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Ph.D. standing in the School of Information. Colloquia, discussion and readings designed to introduce students to the range of interests of the school. (F) Staff

296A. Seminar. (2-4) Course may be repeated for credit as topic varies. Two to four hours of seminar per week. Prerequisites: Consent of instructor. Topics in information management and systems and related areas. Specific topics vary from year to year. (F,SP) Staff

297. Field Study in Information. (1-4) Course may be repeated for credit with consent of instructor. Regular consultation with faculty supervisor. Prerequisites: Must be enrolled in the School of Information and consent of instructor. Individual or group study of specific problems in information management systems with emphasis on field projects and studies. (F,SP) Staff

298. Directed Group Study. (1-3) Course may be repeated for credit as topic varies. Weekly group meetings. Prerequisites: Consent of instructor. Group projects on special topics in information management and systems. (F,SP) Staff

298A. Directed Group Work on Final Project. (2) No credit will be given if 298 has been taken to fulfill final project requirement. Two hours of directed group study per week. Prerequisites: Consent of instructor. Course must be taken for a letter grade to fulfill degree requirements. The final project is designed to integrate the skills and concepts learned during the School of Information Master’s Program and helps prepare students to compete in the job market. It presents experience in formulating and carrying out a sustained, coherent, and significant course of work resulting in a tangible work product; project management; presenting work in both written and oral form; and, when appropriate, working on a multidisciplinary team. Projects may take the form of research papers or professionally oriented applied work. (SP) Staff

299. Individual Study. (1-12) Course may be repeated for credit as topic varies. Format varies. Pre-
requisites: Consent of instructor. Individual study of topics in information management and systems under faculty supervision. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-5)
Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the Ph.D. examinations required of candidates for the Ph.D. degree. (F,SP) Staff

Integrative Biology (College of Letters and Science)
Department Office: 3060 Valley Life Sciences Building, (510) 642-5024
Undergraduate Student Services: (510) 643-7204, (510) 643-1667
Graduate Affairs Office: (510) 643-7330

Chair: Wayne P. Sousa, Ph.D.

Professors
Bruce G. Baldwin, Ph.D. University of California, Davis. Systematics and evolution of vascular plants
Anthony D. Barnosky, Ph.D. University of Washington, Systematics and evolution of mammals
George A. Brooks, Ph.D. University of Michigan. Exercise physiology and metabolism
Roy L. Caldwell, Ph.D. University of Iowa. Invertebrate physiology
D.J. Daugherty, Ph.D. University of Washington, Seattle. Physiological plant ecology and stable isotope ecology
Robert Dudley, Ph.D. University of Cambridge. Biomechanics and comparative physiology
†Robert J. Full, Ph.D. State University of New York, Buffalo. Comparative biomechanics, physiology and functional morphology
†Tyrone B. Hayes, Ph.D. University of California, Berkeley. Developmental biology
†John P. Huitema, Ph.D. University of Texas, Austin. Evolutionary developmental biology
Patricia E. Kirch, Ph.D. Yale University. Human paleoecology, biogeography of the Pacific, phylogenetic approaches to cultural evolution
Miri A. R. Koehn, Ph.D. Duke University. Comparative and ecological biomechanics, marine biology, lycodermatics
Steven L. Lehman, Ph.D. University of California, Berkeley. Motor control
David R. Lindberg, Ph.D. University of California, Santa Cruz. Evolutionary biology
Charles Marshall (Director, UC Museum of Paleontology), Ph.D. University of Chicago. Evolutionary biology
Bro. Mahler, Ph.D. Harvard University. Biology, systematics, and evolutionary biology
Craig C. Moritz, Ph.D. Australian National University. Molecular evolution, conservation biology
Kevin P. O’Neill, Ph.D. Yale University. Paleontology, evolutionary biology
Nipam Patel, Ph.D. Stanford University. Genetics and evolutionary studies of neurogenesis
Thomas M. Powell, Ph.D. University of California, Berkeley. Molecular evolution
Mary E. Powers, Ph.D. University of Washington. Freshwater ecology, food webs
Ellen L. Simms, Ph.D. Duke University. Evolutionary ecology and genetics
Mommy W. Siatkini, Ph.D. Harvard University. Evolutionary theory
Wayne P. Sousa, Ph.D. University of California, Santa Barbara. Population and community ecology
Timothy D. White, Ph.D. University of Michigan, Ann Arbor. Human evolutionary studies
†Howard A. Bernstein (Emeritus), Ph.D.
†William F. Clark, Jr. (Emeritus), Ph.D.
†Harlan C. Dernburg (Emeritus), Ph.D.
†Stephen C. Glickman (Emeritus), Ph.D.
†Carole Hickman (Emeritus), Ph.D.
†Paul Licht (Emeritus), Ph.D.
†William Z. Liddick (Emeritus), Ph.D.
†Jesse H. Lipps (Emeritus), Ph.D.
†Charles S. Nicoll (Emeritus), Ph.D.
†Roberta J. Park (Emeritus), Ph.D.
†James L. Patton (Emeritus), Ph.D.
†Thelma E. Rowell (Emeritus), Ph.D.
†Robert C. Stebbins (Emeritus)
†Thelma E. Rowell (Emeritus)
†Ellen L. Simms, Ph.D.
††Stephen E. Glickman (Emeritus)
††Rudolf Schmid (Emeritus)
††Jim A. McGuire, Ph.D. University of Texas, Austin. Vertebrate phylogeny, population, and evolutionary biology
††Rasmus Nielsen, Ph.D. University of California, Berkeley. Evolutionary biology
††Rudolf Schmid (Emeritus), Ph.D.
†‡Eileen A. Lacey, Ph.D. University of Michigan. Behavioral ecology, population and evolutionary biology

Requisite

**Integrative Biology / 315**

**The Department of Integrative Biology offers a program of instruction that focuses on the integration of information that influences the biology, ecology, and evolution of organisms. It investigates integration at all levels of organization from molecules to the biosphere, and in all branches of the tree of life: plants, animals, fungi, and microbes.**

The department draws from many traditional and emerging fields and levels of biological organization in forging new research directions and answering traditional questions in new ways. The faculty has special strengths in the disciplines of functional morphology, organismal physiology, animal behavior, biomechanics, ecology, systematic biology, paleobiology, population genetics, and evolution.

Students who major in integrative biology will gain both a broad background in the biological sciences, which provides an excellent foundation for those interested in the biology of organisms, populations, and communities, particularly students who might wish to pursue graduate study in any of the subdisciplines listed above or related emerging research areas. It also provides superb training for students interested in health-related professions (medicine, dentistry, veterinary medicine, clinical physics, nursing, pharmacy, optometry, etc.) or allied careers in biology (e.g., psychology, sociology, forestry, wildlife conservation, environmental and resource management, law, etc.).

Through laboratory and/or field courses, independent research projects, or involvement in faculty or graduate student research, students will gain an understanding of scientific logic and methods, through hands-on field or laboratory experiences. This includes the investigation of historical patterns and processes.

**Lower Division.** The foundation for this major includes a basic one-year course in biology, general chemistry, organic chemistry, physics, and at least one year of computer science. Additional coursework in mathematics, statistics, biochemistry, and multiple languages may be helpful for those planning on graduate and/or professional careers.

**Upper Division.** This curriculum is designed to provide the intellectual tools and techniques necessary to conduct multidisciplinary work in the areas of organismal biology and to prepare students as broad-thinking biologists. No formal specialization is possible as an undergraduate; however, as of fall 2010, students will select courses that reflect interests in one of two “tracks” within the major in order to meet all upper division requirements.

Students must complete at least one course in evolutionary genetics, as well as two courses that include laboratory and/or fieldwork to provide experience and methods specific to both living and extinct organisms; three or more additional courses from designated requirement lists (totaling at least 24 upper division units) will complete the upper-division major in integrative biology.

**Courses for Nonmajors**

The department offers a series of courses for students not specializing in integrative biology. These courses provide instruction in the general principles of biology from a variety of viewpoints, ranging from the molecular level through behavior and evolution. Each year, a variety of seminars are available for freshmen and sophomores (IB 39, IB 84) to introduce them to areas of integrative biology.
to foster interdepartmental participation in cancer research. The central research program represents a multidisciplinary approach to an understanding of the mechanisms of cancer using a variety of systems. Graduate student and postdoctoral research programs are supported in various areas of tumor biology: biochemistry, cell biology, endocrinology, biophysics, genetics, molecular biology, and tumor virology. Currently, CRL provides advanced technical resources to cancer and biomedical researchers in the areas of advanced microscopy, flow cytometry, gene targeting, recombinant technology, human stem cell, and an infectious disease facility. Instrumentation in the facilities is operated by highly trained staff who offer instruction in the methods and technology. For more information, visit biology.berkeley.edu/crl.

Center for Interdisciplinary Bio-innovation in Education and Research (CIBER) has been established to lead in the development of a new field of integrative systems biology that moves biology toward greater integration with other disciplines, such as physics, mathematics and engineering, to a degree not seen before. The discipline focuses on the physics of how organisms function and interact with their environment. The goal is to discover basic physical principles that can be applied to a diversity of organisms and unique innovations. The fluid and solid mechanizations of our ecosystems drive direct experimentation, comparative and phylogenetic approaches and both mathematical and physical modeling. Using this approach, the next generation of scientists will gain experience in collaboration across disciplines as well as how to extract principles in biology that inspire novel design in engineering. In addition to developing innovative methods of teaching and research, CIBER has established an interdisciplinary teaching laboratory that allows students to graduate as well as graduate courses to address challenging problems. The Center is an inspiring interdisciplinary learning experience. These facilities are being used in a number of existing and new courses, at both the undergraduate and graduate levels. For more information on CIBER, visit ciber.berkeley.edu.

Center for Stable Isotope Biogeochemistry (CSIB), located on campus, is an analytical facility established as a university education, research, training, and service unit. The center provides high-resolution state-of-the-art instrumentation for analyzing the stable isotope composition of a diverse array of materials (e.g., plant and animal tissue samples, soils, atmospheric gases, water, specific compounds, etc.), as well as space for purifying, extracting, and preparing sample material for analysis. CSIB also serves as a focal point for research and training for many of our programs at Berkeley (e.g., in biology, ecology, paleontology, anthropology, geography, chemistry, hydrology, atmospheric, and soil sciences). The specialized equipment housed in the facility serves a broad range of student, postdoctoral, and faculty needs. This equipment includes several gas phase isotope ratio mass spectrometers (IRMS); these mass spectrometers have the capabilities of analyzing the isotopic composition of hydrogen, carbon, oxygen, nitrogen, and sulfur in biological and geological samples, gasses (biogenic and atmospheric), and water. In addition to the instrument laboratory, CSIB houses a fully-equipped sample extraction and preparation laboratory for handling a full range of sample types. For more information, visit ib.berkeley.edu/groups/biogeochemistry.

Field Station for Behavioral Research is a research institute that supports behavioral studies on animals under natural and seminatural conditions. Situated on 20 acres of wooded hillside at the top of Strawberry Canyon two miles from the center of campus, the station is located in a region that provides a variety of animal species. Faculty from several Berkeley departments, including Integrative Biology, conduct research at the station. Its facilities are available for graduate and postdoctoral research with the approval of the director. Those interested in the field station may contact the director via the Department of Integrative Biology.

Gump South Pacific Research Station, French Polynesia, is located on Moorea (17° 30' S 149° 50' W), one of the Society Islands. 15 km northwest of the main island of Tahiti. The station is located along diverse habitats ranging from coral reefs, lagoons, coastal beaches, freshwater streams, wetlands, and mountain forests. The Gump Station occupies a 100-hectare estate (35 acres) of land to 149m (489ft) at the entrance to Cook’s Bay, providing excellent access to the ocean, lagoon, and island interior. A range of housing options (shared dormitories, private bungalows) and laboratories allow long- and short-term research and education in a diversity of fields, including marine, freshwater, and terrestrial biology, evolutionary and conservation biology, archaeology, anthropology, ethnobotany, geology, and geomorphology. Facilities include boats and 4WD vehicles. A waterfront marine laboratory contains and open seawater system and equipment for UC Scientific Diving. A large climate controlled research building contains offices, library/conference room, and several laboratories including space for morphological work (high (high)-microscope) and molecular genetic analyses. The Station is connected to the Internet via multiple ADSL lines and has WIFI access in all common areas. For further information, contact Dr. Neil Davies, executive director, ndavies@berkeley.alumni.berkeley.edu. For more information, visit moorea.berkeley.edu.

Human Evolution Research Center (HERC) is dedicated to the study of human origins and evolution. HERC represents an international focal point for field and laboratory research and education. It is a center for the study of the processes and products of human evolution. Research by the HERC includes both field and laboratory investigation. HERC’s collections and facilities provide support to faculty and students working on important, large-scale investigations. These include the Middle Awash Project and the Revealing Hominid Origins Initiative (RHOI). For more information on HERC and RHOI, visit their websites at herc.berkeley.edu and rhoi.berkeley.edu, respectively.

Jane Gray Research Greenhouse is operated by the Department of Integrative Biology and comprises approximately 2,400 square feet of state-of-the-art research facilities, by faculty and students. The climate management system is computer-controlled and monitors temperature, humidity, light energy, and wind speed and direction. The system’s responses to these conditions can be controlled centrally or from a remote location through an on-screen ARGS interface to gas heaters, evaporative coolers, vents, fans, and sunshades. The facility provides an ideal resource for plant growth investigations that require closely controlled and monitored conditions. For more information, visit ib.berkeley.edu/jgray/facilities/greenhouse.

Museum of Paleontology (UCMP), a research institute and facility, is located at the University of California, Berkeley. The museum is open to visiting scholars, has one of the largest collections of fossil fossils, invertebrates, plants, and vertebrates in the nation, and also as well as large collections of modern vertebrates and invertebrates. The collection is worldwide in scope and is especially strong in materials from western North America. Research activities include systematic, paleoecological, paleoanthropological, paleoecological, evolutionary, and theoretical paleobiological studies. Fieldwork on all continents by researchers and students associated with the museum continues. The main substantial research facilities include museum biology and fossil preparation laboratories, as well as specialized laboratories for microfossils, pollen, and cast production.
UCMP has an active education and outreach program, using the Web as its primary venue for sharing science with a broader audience. The UCMP website at ucmp.berkeley.edu contains a wealth of information on evolution, paleontology, systematics, and associated sciences, as well as access to collections data and specimen images. Requests for use of the collections or facilities should be directed to the Director, Museum of Vertebrate Zoology, University of California, Berkeley, CA 94720.

Museum of Vertebrate Zoology is an organized research unit (ORU) affiliated with the Department of Integrative Biology and the Division for Biological History Museums. It was established in 1908 and has grown to be one of the largest and most important collections of amphibians, reptiles, birds, and mammals in the world. The museum has permanent exhibits; it is primarily a research organization and a center for graduate and postdoctoral education. The museum’s space in the Valley Life Sciences Building includes all of the collections as well as administrative and research offices for faculty, postdoctoral, and graduate students. In addition, there are laboratories for molecular genetics and bioinformatics. Research activities center on problems in evolutionary biology, with emphasis on systematics, ecology, functional and developmental morphology, behavior, population, and community ecology, and biogeography. The development of field and laboratory methods is encouraged. For more information, contact: Director, Museum of Vertebrate Zoology, University of California, Berkeley, CA 94720; or, for Museum administration: Dr. Mark Stromberg, Carmel Valley, CA 93925. For more information, visit mvz.berkeley.edu.

University and Jepson Herbaria offer a worldwide reference-research collection, laboratories, and herbarium facilities, providing the foundation for basic research in systematic botany, ecology, phytogeography, evolution, and comparative genomics. These resources are available not only to faculty, staff, and students but also to visiting scholars and biologists throughout the United States and other countries. Resources include: (1) the collection itself, over 2.2 million specimens with special strengths in the angiosperm flora of California and elsewhere around the Pacific Rim, as well as in cryptogamic groups including ferns, bryophytes, fungi, and algae; (2) modern laboratories for all types of plant studies, ranging from morphological and developmental systematics; and (3) extensive electronic resources, including an online flora of California, and Interface for accessing electronic records from all California herbaria, the world’s largest collective of digital biological data. The Herbarium has 620 vascular plant species and 166 bird species. While noted for its 50-year research history on vertebrate ecology and oak woodland biology, the reserve is a unique research resource on native grassland restoration. For more information, contact Mark Stromberg at (831) 659-2664 or stromber@berkeley.edu.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Must be taken on a pass/ fail basis. Freshman Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

31. The Ecology and Evolution of Animal Behavior. (3) Students will receive no credit for 31 after taking C144 or Psychology C115B. Two hours of lecture, one hour of film/demonstration and one hour of discussion per week. Prerequisites: Open to all students; designed for biology, psychology, and science majors. Principles of evolution biology as they relate to animal behavior and behavioral ecology with broad coverage of animal groups. Special attention will be paid to the emerging discipline of behavioral ecology. (SP) Caldwell

35AC. Human Biological Variation. (3) Hours of lecture per week. This course addresses modern human biological variation from historical, comparative, evolutionary, and cultural perspectives. It is designed to introduce students to the fundamentals of comparative biology, evolutionary theory, and genetics. This course satisfies the American Cultures requirement. (F) Hiusko

39. Topics in Integrative Biology. (2) Two hours of discussion in fall, two hours of discussion in spring. Prerequisites: Open to freshmen; consent of instructor. Reading and discussion of the literature on particular topics in the field of integrative biology, oral and written communication. Section topics will vary from semester to semester. Students should check with department secretary for each semester’s offerings. (F,SP) Staff

41. Marine Mammals. (2) Two hours of lecture per week, Prerequisites: Designed for those not specializing in Integrative Biology. A survey of marine mammal evolution, biology, behavior, ecology, and politics with a concentration on those species found in the North Pacific. Coverage would include origin and evolution of cetaceans, pinnipeds, sirenians, and sea otters; basic biology of marine mammal groups, and North Pacific species in particular; ecological interactions and role in nearshore and pelagic marine communities; and interactions between humans and marine mammals. (F) Lindberg

C82. Introduction to Oceans. (2) Two hours of lecture per week. Prerequisites: One of the following courses at high school level: physics, chemistry, or biology is recommended. The geology, physics, chemistry, and biology of the world oceans. The application of such knowledge to ecological and human problems will be explored through special topics such as energy from the sea, marine pollution, food from the sea, and climate change. Also listed as Geography C82 and Earth and Planetary Science C82. (F) Bishop, Rhew

48. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week for 15 weeks. One and one-half hours of seminar per week for one unit for 10 weeks. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are departmental-level seminars offered by faculty members in departments across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty and students in the second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP) Staff

88. Leadership Communications for Biology Schol- ars. (1) Two hours of lecture/discussion per week. Prerequisites: Acceptance into Biology Scholars Program. Leadership skills and abilities such as communication, collaboration, critical thinking, and resourcefulness are critical to academic, professional, and personal success. Students who lead and influence leaders is evident in every aspect of health and science such as designing innovative health programs, obtaining funding, conducting cutting-edge research, developing and gaining support to implement policy solutions. This course provides an understanding of the principles of leadership and communications for students in the Biology Scholars Program. Students will nurture those traits in themselves and apply those principles in situations specifically related to the health and science sectors. The course is taught in weekly lecture and discussion sessions with case studies and group projects. The specific laboratory course is designed to help students identify leadership principles; understand one’s own leadership style and goals; know what resourcefulness means and the strategies that can enhance it; develop skills in written and verbal communication; and develop skills in collaboration and effective team management. (F) Hayes, Kim, Mynick

95. Special Research Project in Biology 1B. (1) Four hours of special field research per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor; enrollment in Biology 1B. Students enrolled in Biology 1B can participate in special field research in addition to attending regular laboratory sections. Students work independently with minimal direct supervision. Students will develop a project, collect and record data, conduct and analyze experiments, write a report, and make an oral presentation. Project may require traveling to off-campus sites. (F,SP) Staff

C96. Studying the Biological Sciences. (1) Two hours of lecture per week. Must be taken on a passed/ not passed basis. Prerequisites: Consent of instructor. Freshmen will be introduced to "the language" of the biological sciences, along with an in-depth orientation to the academic life and the culture of the university as they relate to majoring in biology. Students will learn concepts, skills, and how to communicate that they can use in their major course, and as future science
98. Directed Group Study. (1-4) Course may be repeated for credit. One hour of group study per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Freshmen and sophomores only. Lectures and small group discussions focusing on topics of mutual interest, varying from semester to semester. (FSP) Staff

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: GPA of 3.0 or higher. Offered in the spring semester. Application for credit must be submitted to the student's major department and must be approved by the department chair. Research is intended for the academically superior student. Enrollment only with prior approval of faculty adviser directing the research. (FSP) Staff

Upper Division Courses

C100. Communicating Ocean Science. (4) Two and one-half hours of lecture, one hour of discussion, and two hours of fieldwork per week. Prerequisites: One course in introductory biology, geology, chemistry, physics, or marine science required and interest in ocean science; junior or senior standing; consent of instructor. A course for undergraduate students interested in improving their ability to communicate their scientific knowledge by teaching ocean science in elementary schools or science centers/aquariums. The course will combine ocean science and inquiry-based instruction methods and learning pedagogy with six weeks of supervised teaching experience in a local school classroom or the Lawrence Hall of Science with a partner. Thus, students will practice communicating scientific knowledge and receive mentoring on how to improve their presentations. Also listed as Geography C146 and Earth and Planetary Science C100. (SP) Ingram

C101. Diversity of Plants and Fungi. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B. Must be taken concurrently with 101L. An introduction to the biology and evolution of the major groups in the plant, algal, and fungal kingdoms. Also listed as Plant and Microbial Biology C102. Offered alternate years. (F) Staff

C101L. Laboratory in the Diversity of Plants and Fungi. (2) Four hours of laboratory per week and two 1-day field trips. Prerequisites: Biology 1A-1B. Must be taken concurrently with 101. Laboratory for C102. Also listed as Plant and Microbial Biology C102L. Offered alternate years. (F) Staff

102. Introduction to California Plant Life. (2) Two hours of lecture per week. Prerequisites: Biology 1B or consent of instructor. Must be taken concurrently with 102L. The relationship of the main plant groups and the plant life of California to climate, soils, vegetation, geological and recent history, evolution/protection, and conservation. (SP) Staff

102L. Laboratory in California Plant Life. (2) Six hours of laboratory per week and at least two Saturday field trips. Prerequisites: Biology 1B or consent of instructor. Must be taken concurrently with 102L. A survey of California floristics focusing on identification and taxonomy of the main plant genera and major plant families, as well as the use of keys to identify random plant forms, ferns, and mosses, and fieldwork in populating the state. (SP) Staff

103. Invertebrate Zoology. (3) Three hours of lecture per week. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 103L. Formerly Zoology 103L An introductory survey of the biology of invertebrates, stressing comparative functional morphology, phylogeny, natural history, and aspects of physiology and development. Offered alternate years. (SP) Lindberg

103L. Invertebrate Zoology Laboratory. (2) Six hours of laboratory per week plus several weekend field trips. Prerequisites: Biology 1A, 1B. Must be taken concurrently with 103. Formerly Zoology 188. Laboratory study of invertebrate diversity and functional morphology, and field study of the natural history of local marine invertebrates. Offered alternate years. (SP) Lindberg

104. Natural History of the Vertebrates. (3) Three hours of lecture per week. Prerequisites: Must be taken concurrently with 104L. Formerly Zoology 107. A study of the vertebrates, exclusive of fish. (SP) McGuire, Bowie

104L. Vertebrate Natural History Laboratory. (2) Three hours of laboratory and a four-hour field trip per week plus special field projects. Prerequisites: Biology 1A-1B. Must be taken concurrently with 104. Formerly Zoology 187. Laboratory and field study of local vertebrates exclusive of fish. (SP) McGuire, Bowie

106. Biological Oceanography. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B; 103L, recommended, chemistry, and calculus. This course explores the interactions of organisms with physical, chemical, and geological processes in the ocean. Overviews of basic physical, chemical, and geological principles and the major functional groups of marine organisms are followed by interdisciplnary discussions of open-ocean pelagic systems, the deep sea, coastal oceans, estuaries, and intertidal environments. Grade is based on short written assignments.

106A. Physical and Chemical Environment of the Ocean. (2) Four hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B; Chemistry 1A or 4A; Mathematics 1A or 16A. Recommended: Physics 7A or 8A. Recommended: 82. The biological implications of marine physics and chemistry.Oceanic currents and proprieties of seawater. Geophysical fluids. Currents and circulations. Deep sea. Waves, tides, and bottom boundary layers. The coastal ocean; estuaries. Air/sea interaction. Mixing. Formation of water masses. Modeling biological and geochemical processes. Ocean and climate change. (SP) Powell

106L. Laboratory in Biological Oceanography. (2) Three hours of scheduled laboratory plus three hours of unscheduled laboratory per week, one-day research cruise on San Francisco Bay, and one-day intertidal sampling trip. Prerequisites: Biology 1A-1B; 103, 103L. Plant Biology 120 and 120L recommended. Must be taken concurrently with 106L. The laboratory will allow students to see and work with important functional groups of marine organisms and to learn and use standard oceanographic methods in experiments. Enrollment limit is 16 per laboratory section.

107. Principles of Plant Morphology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B; must be taken concurrently with C107L. An analysis of the structural diversity of multicellular plants, especially the higher forms, with emphasis on developmental mechanisms responsible for this variation in form and the significance of this diversity in relation to the environments in which plants grow. Also listed as Plant and Microbial Biology C107L. Offered alternate years. (F) Speccht

107L. Laboratory for Principles of Plant Morphology. (2) Six hours of laboratory per week. Prerequisites: Biology 1A-1B; must be taken concurrently with 107. Formerly 100L. Laboratory designed to accompany C107, Principles of Plant Morphology. Also listed as Plant and Microbial Biology C107L. Offered alternate years. (F) Speccht

112. Horticultural Methods in the Botanical Garden. (1) Three hours of direct participation of field work per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly 112L. An introduction to horticultural techniques utilizing the diverse collections of the UC Botanical Garden. (F,SP) Licht

113. Paleobiological Perspectives on Ecology and Evolution. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Prior biological knowledge required. No paleontological or geological background required. Formerly 108. This course will center around answering the following questions: What do the fossil and geologic records tell us about ecological and evolutionary processes? What do they teach us that cannot be learned from the living world alone? In answering these questions, the course will provide an introduction to the analysis of key problems in paleobiology, with an emphasis on how evolutionary and ecological processes operate on geologic timescales. (SP) Marshall

115. Introduction to Systems in Biology and Medicine. (4) Two hours of lecture and two hours of computer laboratory per week. Prerequisites: Biology 1A or 1B, Chemsitry 1A or 16A. A course designed to get students interested in the study of systems with the emphasis on feedback regulation; competition and cooperation; gene expression; switches and circuits; random processes; chaos; mechanisms for error correction; and the properties of networks. Examples are selected from many fields including medicine, physiology, ecology, biochemistry, cell biology, and geology. Students learn to conceptualize and quantify interactions within biological systems using simple mathematical models and computer programs. No previous experience in programming is required. (SP) Lam

117. Medical Ethnobotany. (2) Six hours of laboratory per week. Formerly 117L. Laboratory will focus on studying medicinal plants from the major ecosystems and geographical regions of the world. Students will learn common names, scientific names, plant families, field identification, habitats, and ethnomedical uses of medicinal plants. How the medicinal plant can be prepared, added to the food, and used for primary health care to tropical countries; human pharmacology, human diseases, and mechanisms of action of plant-derived drugs. (F) Carlson

117L. Medical Ethnobotany Laboratory. (2) Six hours of laboratory per week. Formerly 117L. Laboratory will focus on studying medicinal plants from the major ecosystems and geographical regions of the world. Students will learn common names, scientific names, plant families, field identification, habitats, and ethnomedical uses of medicinal plants. How the medicinal plant can be prepared, added to the food, and used for primary health care to tropical countries; human pharmacology, human diseases, and mechanisms of action of plant-derived drugs. (F) Carlson

118. Host-Pathogen Interactions: A Trans-Disciplinary Approach. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B. The second half of the 20th century has been marked by great strides in the battle against infectious diseases. However, the forces that drive bacterial evolution are not dormant and continue to pose new challenges for science and medicine. In this course, we will cover various aspects relating to host-pathogen interactions in animals and in plants, learning about molecular mechanisms responsible for this variation in form and the significance of this diversity in relation to the environments in which plants grow. Also listed as Plant and Microbial Biology C107L. Offered alternate years. (F) Speccht

119. Evaluating Scientific Evidence in Medicine. (3) Two hours of lecture, one computer laboratory, and two discussion per week. Prerequisites: Biology 1A-1B. A course in critical analysis of medical reports and studies using recent controversial topics in medicine. Course will focus on information gathering, hypothesis testing, evaluating study design, methods, and results, and statistical and attribution of causation. Students participate in a mock trial as a way to demonstrate their abilities to gather, critically analyze, and present scientific and medical evidence. (SP) Caldwell
123A. Exercise Physiology. (3) Three hours of lecture per week. Prerequisites: Biology 1A, Chemistry 3B, and either 132 or Molecular and Cell Biology 136. 123L. Exercise Physiology Laboratory. (123L) Three hours of laboratory per week. Prerequisites: 123 or 123L. Obtain permission from the instructor. Discussion of the measurement of physiological parameters and to be able to compile, compare, contrast, and interpret physiological data. Laboratory demonstrations and exercises will explain, by way of laboratory content. (F) Brooks
123AL. Laboratory Exercises and Demonstrations Exercise Physiology and Metabolism. (2) Three hours of laboratory per week. Prerequisites: 132 and 132L. Obtain permission from the instructor. Discussion of the measurement of physiological parameters and to be able to compile, compare, contrast, and interpret physiological data. Laboratory demonstrations and exercises will explain, by way of laboratory content. (F) Brooks
C125L. Introduction to the Bioclinical Analysis of Human Movement. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Physical Education 9 and Integrative Biology 131 and 131L. Formerly C165. Basic biomechanical and anatomical concepts of human movement and their application to fundamental movement patterns, exercise, and sport skills. Also listed as Physical Education C165. (F) Scott
127. Motor Control. (2) Two hours of lecture per week, 1 hour of laboratory per week. Prerequisites: 131 or equivalent; a course in physiology (132, Molecular and Cell Biology 32, or equivalent). Must be taken concurrently with 127L. Control of human posture, locomotion, and voluntary movements. We start with control at the spinal level: how the brain controls muscle activity in skin mechanoreceptors and simple spinal connections permit control of a wide variety of movements. We then study the anatomy and physiology of motor systems. Finally, we use principles of control and information theories to synthesize knowledge of these elements to understand the control systems that regulate posture, locomotion, and voluntary movement. (F) Lehman
127L. Motor Control Laboratory. (1) Two hours of laboratory per week. Prerequisites: A course in human anatomy (131 or equivalent); a course in physiology (132, or Molecular and Cell Biology 32 or 136, or equivalent). Must be taken concurrently with 127L. The laboratory component of 127L leads the students in the development of concepts and questions regarding control of human movements. Students are both investigators and subjects in hands-on experiments investigating the application of information theory to fast, accurate movements, recruitment and rate coding of muscle force, electromyography, skin reflexes, knee-jerk reaction time, electromyography. Experimental sessions of 127L are designed to teach elementary control theory, spinal level control, and neuroanatomy of motor systems using computer simulations. The laboratory culminates with an independent investigation, in which students identify their own questions, develop hypotheses, design and perform experiments, and present their studies in a symposium. (F) Lehman
128. Sports Medicine. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Background in anatomy, physiology, or exercise physiology recommended. Survey course of sports medicine including topics of athletic injury (cause, evaluation, and treatment options), exercise physiology, exercise and fitness testing, issues specific to female athletes, drug abuse in sports, environmental issues (heat, altitude, sun exposure), nutrition, careers in sports medicine, introduction to clinical research. (SP) McLaughlin
C129L. Human Physiological Assessment. (3) Two hours of laboratory per week. Prerequisites: C129 or C129L. Three hours of laboratory per week. Prerequisites: C129, C129AL (may be taken concurrently). Formerly C129L. Principles and theories of human physiological assessment in relation to physical fitness and wellness. Performance of laboratory procedures in the measurement and interpretation of physiological fitness (cardiorespiratory endurance, body composition, musculoskeletal fitness). Also listed as Physical Education C129. (SP) Johannesen
131. General Human Anatomy. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B or Chemistry 1A. Designed to be taken concurrently with 131L. The functional anatomy of the human body as illustrated by gross and microscopic examination. (F) Carlson
131A. Applied Anatomy. (1) Course may be repeated once for credit. One hour of lecture per week. Must be taken on a pass/no pass basis. A series of 15 lectures by experts, who have become successful physicians and surgeons. The purpose is to provide the practical applications of anatomy, e.g., plastic surgeons, neurosurgeons, vascular surgeons, pathologists, radiologists, in the measurement of physiological parameters and to be able to compile, compare, contrast, and interpret physiological data. Laboratory demonstrations and exercises will explain, by way of laboratory content. (F) Brooks
C131L. Laboratory in the Mechanics of Organisms. (3) Students will receive no credit for C131L if they have received credit for C131L or C131L. Three hours of laboratory per week. Prerequisites: Biology 1A-1B or Chemistry 1A. 131L (may be taken concurrently). Preparation of human dissections, models, and microscopic slides. (F) Carlson
132. Survey of Human Physiology. (3) Students will be passed/not passed for 132L. Prerequisites: 131 or 131L or 101 or Molecular and Cell Biology 32, 136. Three hours of lecture per week. Prerequisites: 131, Biology 1A. Mechanisms by which physiological principles are maintained in healthy humans. From a basis in elementary theories of information and control, we develop an understanding of homeostasis of cellular composition, structure, and energy metabolism. We then study neural and endocrine signaling in humans, and develop the key concepts of control and homeostasis in the major organ and multi-organ systems, including cardiovascular, respiratory, renal, metabolic, reproductive, and immune systems, growth and development of skeletal and motor systems. (SP) Brooks, Kaufer, Lehman
132L. Mammalian Physiology Laboratory. (2) Students will receive no credit for 132L after taking Molecular and Cell Biology 32L or 136L, or if currently enrolled in Molecular and Cell Biology 9 or 32L. Prerequisites: Previous or concurrent enrollment in 132 or equivalent, or consent of instructor. In the laboratory component of Integrative Biology 132, students gain hands-on experience measuring physiological parameters, interpreting physiological data, designing experiments, and communicating ideas in writing and orally. Guided investigations include measurement of cardiac output, respiratory exchange, responses of skeletal muscle to electrical stimulation, electromyography, pulmonary and cardiovascular measurements in humans, contractility and regulation of the frog heart, human blood pressure, regulation of body fluids. In two independent investigations, students identify their own questions, develop hypotheses, design and perform experiments, and present their studies in symposia. Background in elementary statistics, data analysis, and computer skills is recommended. Written reports and interpretation of results. Latter third of course devoted to independent research projects. Written reports and presentation of project results are required. Also listed as Electrical Engineering C1450 and Biomedical Engineering C1450. (SP) Staff, Full
137. Human Endocrinology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B; human physiology (132L) strongly recommended. Course will address the role of hormones in physiology with a focus on humans. Regulation of hormone secretion and mechanisms of hormone action will be discussed. Physiological processes to be addressed include energy metabolism, water balance, growth, fetal development. Experimental and clinical aspects will be addressed. (F) Hayes
138. Comparative Endocrinology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A-1B; human physiology (132L) strongly recommended. The primary goal of this course is to provide students with a broad understanding of the evolution of hormonal systems. A comparative approach allows us to envisage how the complex mammalian endocrine system presumably evolved from that of more primitive vertebrates. Students will learn about endocrine pathways and endocrine-based behaviors of diverse species (e.g., birds, reptiles, and mammals. In addition, students will gain an understanding of the experimental methods used in endocrine research. The class teaches students how to read and interpret the primary scientific literature; thus it encourages the critical thinking that is a fundamental skill for any scientist. (F) Bentley
C139. The Biology of Stress. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A or Psychology 110. This is an upper division course required for all Psychology Majors. The primary goal of this course is to provide students with a broad understanding of the evolution of hormonal systems. A comparative approach allows us to envisage how the complex mammalian endocrine system presumably evolved from that of more primitive vertebrates. Students will learn about endocrine pathways and endocrine-based behaviors of diverse species (e.g., birds, reptiles, and mammals. In addition, students will gain an understanding of the experimental methods used in endocrine research. The class teaches students how to read and interpret the primary scientific literature; thus it encourages the critical thinking that is a fundamental skill for any scientist. (F) Bentley
140. Biology and Sociobiology of Human Reproduction. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: At least one course in physiology (e.g., 132, Molecular and Cell Biology 32, or consent of instructor). Evaluation of human reproductive, social problems and demographics, anatomy and physiology of reproduction, endocrinology of the menstrual cycle; puberty, psycho-physiology of copulation and orgasm; fertilization and implantation infertility and sexual dysfunction; conception and contraception; pregnancy and lactation; sexual differentiation of brain and reproductive organs; homosexuality and transsexuality. (SP) Carlson
C142L. Introduction to Human Osteology. (6) Six hours of lecture and 14 hours of laboratory per week. Prerequisites: Anthropology 1, Biology 1B. Formerly C142L. An intensive study of human skeletal reconstruction of individual and population characteristics, emphasizing methodology and analysis of human populations from archaeological and paleontological contexts, taphonomy, and paleopathology.
C143A. Biological Clocks: Physiology and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of biological prerequisites for the major and consent of instructor; a course in mammalian physiology recommended. This course provides a comprehensive overview of behavioral endocrinology beginning with hormone production and actions on target tissues and continuing with an exploration of a variety of behaviors and their hormonal regulation/consequences. The course uses a comparative approach to examine the reciprocal interactions between endocrine and nervous systems in behavior, considering the effects of hormone on development and adult behavior in addition to how behavior regulates endocrine physiology. While much of the course focuses on vertebrates, invertebrates are included because the relevance to humans is explored where appropriate. Topics include sexual differentiation and sex differences in behavior, reproductive, parental, and aggressive behaviors, and hormonal and behavioral homeostatic regulation. Also listed as Psychology C116.

144. Animal Behavior. (4) Students will receive no credit for 144 after taking C144, 145, or Psychology C115B. Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A or 1B; one semester of college-level mathematics (algebra). This course is a detailed survey of the physiological approaches used in understanding the relationships between plants and their environment from the functional level (e.g., photosynthesis, nutrient uptake, water use) to the population level (e.g., population growth, distribution and abundance). Special emphasis is placed on the biological clocks that generate daily, lunar, seasonal, and annual rhythms in various animals including people. Emphasis on neuroendocrine substrates, development and adaptive significance of estrous cycles, feeding rhythms, reproductive and hibernation cycles, body weight and migratory cycles. Also listed as Psychology C113.

C143B. Hormones and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of biological prerequisites for the major and consent of instructor; a course in mammalian physiology recommended. This course provides a comprehensive overview of behavioral endocrinology beginning with hormone production and actions on target tissues and continuing with an exploration of a variety of behaviors and their hormonal regulation/consequences. The course uses a comparative approach to examine the reciprocal interactions between endocrine and nervous systems in behavior, considering the effects of hormone on development and adult behavior in addition to how behavior regulates endocrine physiology. While much of the course focuses on vertebrates, invertebrates are included because the relevance to humans is explored where appropriate. Topics include sexual differentiation and sex differences in behavior, reproductive, parental, and aggressive behaviors, and hormonal and behavioral homeostatic regulation. Also listed as Psychology C116.

146. Behavioral Ecology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: C144. An in-depth examination of the ecological and evolutionary bases for behavioral diversity. Topics covered include asexual versus sexual reproduction, altruism and inbreeding, and life history trade-offs. Students will read original literature and give a critique of a recent research paper. Also listed as Environ Sci, Policy, and Management C149. Offered alternate years. (SP) Staff 151. Plant Physiological Ecology. (3) Three hours of lecture per week. Prerequisites: Biology 1B or consent of instructor (an introductory course in ecology, plant physiology, and biochemistry is very helpful). This course is a detailed survey of the physiological approaches used in understanding the relationships between plants and their environment from the functional level (e.g., photosynthesis, nutrient uptake, water use) to the population level (e.g., population growth, distribution and abundance). Special emphasis is placed on the biological clocks that generate daily, lunar, seasonal, and annual rhythms in various animals including people. Emphasis on neuroendocrine substrates, development and adaptive significance of estrous cycles, feeding rhythms, reproductive and hibernation cycles, body weight and migratory cycles. Also listed as Psychology C113.

152. Environmental Toxicology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Background in biology or chemistry recommended. The environmental fate and effect of toxic substances from human activities is examined. Focus is on aquatic systems, including their biological effects from the molecular to the community level. Course will review pollutant types, principal sources, impacts on aquatic organisms, monitoring approaches, and regulatory issues. Offered alternate odd years. (SP) Dawson 151L. Plant Physiological Ecology Laboratory. (2) Five hours of laboratory per week, plus one weekend field trip required. Prerequisites: Concurrent enrollment in 151. This course is designed to expose students to a variety of techniques and measurements of different plant species growing in the field or greenhouse. Offered alternate odd years. (SP) Dawson

153. Ecology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B or consent of instructor. Principles of microbial, animal, and plant population ecology, illustrated with examples from marine, freshwater, and terrestrial habitats. Consideration of the roles of physical and biological processes in structuring natural communities. Observational, experimental, and theoretical approaches to population and community ecology will be discussed. Topics will include quantitative approaches relying on algebra, graph analysis, and elementary calculus. Discussion section will review recent literature in ecology. (F) Ackery 153LF. Laboratory in Population and Community Ecology. (3) Six hours of laboratory per week, plus two or three weekend field trips. Prerequisites: 153 (may be taken concurrently) or consent of instructor; introductory course in statistics strongly recommended. Formerly 153L. An introduction to the study of ecological patterns and processes in nature. Course begins with a series of group field exercises conducted in local terrestrial, aquatic, and marine habitats. These exercises provide practice in one or more biological methodology, experimental design, and statistical interpretation of results. Latter half of course devoted to independent research projects. A written report and class presentation of project results are required. 154. Plant Ecology. (3) Three hours of lecture/discussion per week. Prerequisites: Biology 1B. Enrollment in accompanying lab course 154L is encouraged but not required. An introductory course covering individuals, populations, communities, and global processes. Topics include form and function, population ecology, life histories, community structure, and global change. Diversity, functional diversity, and global change. (F) Ackerly

155. Holocene Paleoecology: How Humans Changed the Earth. (3) Students will receive no credit for 155L after taking 155 and/or Anthropology 129D. Deficient grade in 155 and/or 129D may be removed through 155L. Three hours of lecture per week. Prerequisites: Either Anthropology 2 or Biology 1A. Since the end of the Pleistocene and especially with the development of agriculturally based societies in the Holocene, people have had cumulative impacts on natural landscapes and biotic resources worldwide. Thus, "global change" and the biodiversity crisis are not exclusively developments of the industrial and post-industrial world. This course uses a multi-disciplinary approach, drawing upon methods and data from archaeology, paleontology, geomorphology, palaeontology, and historical ecology to unravel the impacts of our species past 10,000 years. Also listed as Anthropology C129D. (F,SP) Kirch

C156. Principles of Conservation Biology. (3) Three hours of lecture and one one-half hours of discussion per week. Prerequisites: Biology 1A-1B or equivalent. This course will provide students with a thorough understanding of conservation biology. Factors that affect the creation, destruction, and distribution of biological diversity at the level of the gene, species, and ecosystem level will be addressed. Tools and management options derived from ecology and evolutionary biology that can recover or prevent the loss of biological diversity are explored. Also listed as Environ Sci, Policy, and Management C103. (SP) Beissinger

157FL. Ecosystems of California. (4) Six hours of discussion per week. Prerequisites: Biology 1B or consent of instructor. Formerly 157L. The ecosystems of California are studied from both an ecological and historical biogeographical perspective with a focus on the human utilization of natural resources. Course may be repeated for credit. Three hours of laboratory per week. Prerequisites: Biology 1A or equivalent. A consideration of the environmental fate and effect of toxic substances from human activities is examined. Focus is on aquatic systems, including their biological effects from the molecular to the community level. Course will review pollutant types, principal sources, impacts on aquatic organisms, monitoring approaches, and regulatory issues. Offered alternate odd years. (SP) Dawson

158FL. Biology and Geomorphology of Tropical Islands. (13) Three hours of lecture and field trips, plus three hours of lecture for three weeks. Formerly C158. Natural history and evolutionary biology of island terrestrial and freshwater organisms, and of marine organisms in the coral reef and lagoon systems will be studied, and the geomorphology of volcanic islands, coral reefs, and reef islands will be discussed. Features of island biogeography will be illustrated with topics linked to subsequent field studies on the island of Moorea (French Polynesia). Also listed as Environ Sci, Policy, and Management C107. (F) Staff

160. Evolution. (4) Three hours of lecture and one one-half hour of discussion per week. Prerequisites: Biology 1A or equivalent. An introduction to the processes and consequences of organic evolution. History and philosophy of evolutionary thought; the different lines of evidence and fields of inquiry that bear on the understanding of evolution. The major features and processes of evolution: the nature of evolutionary time; the evolutionary process and the mechanism of natural selection; the fossil record, rates, and patterns of evolution; extinction; population processes of selection, adaptation, and other forces; genetics, genomics, and the molecular basis of evolution; evolution and developmental biology; sexual selection; behavioral evolution; applications of evolutionary biology to medical, agricultural, conservational, and anthropological research. (F) Boone, Montez, Padian

161. Population and Evolutionary Genetics. (4) Course may be repeated for credit. Three hours of
162. Ecological Genetics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B. This course integrates ecology, genetics, and evolution. It provides a comprehensive, integrative approach to understanding evolutionary processes and the mechanism of adaptation. Three hours of lecture and one hour of discussion per week. (SP) Nielsen

163. Molecular and Genomic Evolution. (3) Three hours of lecture per week. Prerequisites: Biology 1A-1B or equivalent. This course introduces the methods and principles of molecular evolution, including the use of DNA sequences to study phylogenetic relationships and to infer evolutionary processes. Topics include the use of DNA sequences to study evolutionary relationships between species, comparative genomics, and the role of molecular evolution in adaptation. (SP) Bachtrog, Slatkin

164. Human Genetics and Genomics. (4) Three hours of lecture, one hour of discussion, and two hours of computer laboratory per week. Prerequisites: Biology 1A, 1B, and Math 16A, or equivalent. This course will introduce students to basic principles of genetics, including transmission genetics, genetic mapping, population genetics, and the principles of molecular evolution. The course will also introduce students to recent developments in genetic diseases, including the role of genetic factors in human health and disease. Three hours of lecture, one hour of discussion, and two hours of computer laboratory per week. (SP) Bachtrog, Nielsen, Slatkin

165. Introduction to Quantitative Genetics. (4) Two hours of lecture and two hours of computer laboratory per week. Prerequisites: Biology 1B, a basic genetics course, and a basic statistics course. Is IQ inherited in humans? Do their genes make them eat more? Can species evolve fast enough to keep up with global climate change? Why do flowers have so many different colors and shapes? Quantitative genetics helps answer these questions and more. Quantitative genetic theory extends the consequences of Mendelian inheritance to characters that are affected by many genes. This course provides an introduction to the methods used to study the genetic basis of complex traits in humans. Three hours of lecture and two hours of computer laboratory per week. (SP) Bachtrog, Slatkin

166. Evolutionary Biogeography. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B, 11, Geography or Earth and Planetary Science 50. The goals of the course are to: (1) examine how geographically-linked characteristics of species influence their potential for evolution and extinction and (2) provide an overview of the analytical techniques and applications for studying the interplay between geographic ranges, environment, evolution, and extinction. Accordingly, the course begins by examining what geographic patterns of species distributions tell us about the factors that control them. We will then explore how geographic-range characteristics influence and interact with speciation and extinction processes. With that foundation, we will examine how species distributions in communities and how ecological processes govern distributions at the community and landscape levels, touching on such topics as community energetics, scaling issues, and the influences of humans on “natural” ecosystems. The last third of the course will be devoted to an overview of quantitative analytical techniques that commonly are used to study interactions between biogeographic ranges, evolutionary processes, extinction, and environmental change. (SP) Barnosky

168. Systematics of Vascular Plants. (2) Two hours of lecture per week. Prerequisites: Biology 1A-1B. Must be taken concurrently with 168L. A discussion of the philosophy, principles, techniques, and history of botanical systematics. An outline of the major groups of vascular plants and their classification. (SP) Baldwin

169. Evolutionary Medicine. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1B, or equivalent. Formerly 163. This course explores the ways that evolutionary theory can illuminate our understanding of human health and disease. The integration of evolutionary concepts into health sciences can deepen our understanding of the origins of diseases and how human populations evolve in response to changing environments. (SP) Baldwin

173. Mammalogy. (2) Two hours of lecture per week. Prerequisites: 104. 173L is (must be taken concurrently). An introduction to the biology of extant and fossil mammals. Topics covered include elements of modern mammalian biology such as morphology, physiology, ecology, and behavior. For all topics, the traits that define mammals are highlighted, and themes evident in modern mammalian lineages. Two midterms and several short assignments. Offered alternate years. (SP) Carlson

175L. Herpetology Laboratory. (2) Four hours of lab work per week. Prerequisites: Zoology 183 and/or Anthropology C124C. Three hours of lecture required. A laboratory course in the identification and study of the classification and natural history of amphibians and reptiles. Offered alternate years. (F) McGuire

175LF. Herpetology Laboratory. (2) Four hours of laboratory per week, plus two field trips. Prerequisites: 104. Must be taken concurrently with 175. Formerly Zoology 185. Laboratories will teach students the identification of amphibians and reptiles, and an independent research project. Offered alternate years. (SP) McGuire

181. Paleobotany—The 500 Million-Year History of a Greening Planet. (3) Two hours of lecture and one and one-half hours of discussion per week. Prerequisites: Courses in botany and geology are recommended. Introduction to evolution of plants and their ecosystems through time. Earliest plant life, transition to land, and the emergence of terrestrial ecosystems. Follow the evolution of major plant groups during important moments in time through the Phanerozoic (last 650 million years). Explore ancient fossilized plant communities, their ecological properties, and examine how major environmental upheavals affected their evolution. The plants we study have had a major influence on the functioning of our planet’s surface and atmosphere. (SP) Looy

183. Evolution of the Vertebrates. (3) Must be taken concurrently with 183L. Three hours of lecture per week. Prerequisites: Biology 1B; introductory courses in earth history and zoology are recommended. Formerly lecture portion of Paleontology 125. An introduction to vertebrate paleontology, focusing on the history and phylogeny of vertebrates ranging from fishes to humans. Emphasis on evolution, taxonomy, functional morphology, paedomorphosis, and the classification of vertebrates. Offered alternate years. (SP) Panadian

193L. Laboratory in Vertebrate Evolution. (1) Must be taken concurrently with 193. One hour of laboratory per week. Prerequisites: Biology 1B; introductory courses in earth history and vertebrate zoology are recommended. Formerly 193. An introduction to the vertebrate skeleton, with emphasis on comparative osteology and vertebrae anatomy. Offered alternate years. (F) Looy

194. Morphology of the Vertebrate Skeleton. (2) Three hours of lecture per week. Prerequisites: Biology 1B or Anthropology 1. Must be taken concurrently with 194L. Lectures on comparative osteology of vertebrates, with emphasis on selected groups of terrestrial vertebrates. Offered alternate years. (SP) Panadian

C185. Human Paleontology. (3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Anthropology 1, Biology 1A-1B. C185. Origin and relationships of the extinct forms of mammals (sept. 105 million years). Formerly 185. Offered alternate years. (SP) White

C187. Human Paleobiography of the Pacific. (3) Students will receive no credit for C187 after taking 187. A deficient grade in 187 maybe removed by taking C187 and/or Anthropology 124C. Three hours of lecture per week. Prerequisites: Biology 1B or consent of instructor. This course examines the history of human dispersal across Oceania from the perspectives of biogeography and evolutionary ecology. Students will be encouraged to interpret the evidence of human ecological interactions in the context of broader patterns of global and local change.
persal, colonization, and extinction, and adapted in a
variety of ways to the diversity of insular ecosystems.
A dual evolutionary model takes into account cultural
evolution and transmission, as well as biological diver-
sion of human populations. This course also explores
the impacts of human populations on isolated and
fragile insular ecosystems, and the reciprocal effects of
anthropogenic and human cultures. Also listed as Anthro-
polgy C124C. (F,SP) Kirch

194. Undergraduate Student Instructor for Inte-
grative Biology Courses. (1-3) Course may be
repeated for credit. Three to four hours of lecture per
week. Must be taken on a passed/not passed basis.
Prerequisites: Open to undergraduate students.
Course may be repeated for credit. Must be taken
with consent of instructor. (F,SP) Staff

C195. Introduction to Global Health Disparities
Research. (2) One hour of lecture and one hour of
discussion per week. Prerequisites: All course par-
ticipants must be accepted into the UC Berkeley MHGH
Fellowship Program. This course is designed to pre-
pare training students for the “Minor in Global Health”
(MHGH) program to conduct a 10-week infectious disease research project in a disease-
endemic country. The course provides a background in
neglected tropical disease; research, interview, field
research ethics, and the conduct of health research in
low-resource settings. Also listed as Public Health
C117. (SP) Reinoeta

H196A-H196B. Thesis Course. (3-3) Course may
be repeated for credit. Individual arranged. Prereq-
uires: Open to students in the Honors Program.
Individual study and research for at least one aca-
demic year on a special problem to be chosen in con-
sultation with a member of the staff; preparation of
the thesis on broader aspects of this work. (F,SP)
Must be taken in either the third or fourth quarter of
the academic year on a special problem to be chosen in con-
sultation with a member of the staff; preparation of
the thesis on broader aspects of this work. (F,SP)
Must be taken in either the third or fourth quarter of
the academic year on a special problem to be chosen in con-
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sultation with a member of the staff; preparation of
the thesis on broader aspects of this work. (F,SP)
Must be taken in either the third or fourth quarter of
the academic year on a special problem to be chosen in con-
sultation with a member of the staff; preparation of
the thesis on broader aspects of this work. (F,SP)
241. Advanced Topics in Endocrine-Regulated Development. (3) Course may be repeated for credit. Three hours of seminar per week. This course will examine experimental endocrine disruption, such as the use of pharmaceuticals to regulate hormones in humans, livestock, and wildlife. We will also examine endocrine disrupting pollutants and their impacts on wildlife and humans, including their potential role in cancer. (SP) Hayes

245. Functional Neuroanatomy. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. Development, structural (gross and microscopic) and functional relationships of the mammalian central nervous system. (SP) Diamond

245L Functional Neuroanatomy Laboratory. (2) Six hours of laboratory per week. Prerequisites: Consent of instructor. Histological examination of the human nervous system; gross dissection of the human brain. (SP) Diamond

246. Seminars in Systems Biology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. This course discusses current research in systems biology with particular emphasis on gene regulation and cell biology. The course covers the critical analysis of primary research data, computational modeling, and integrates fundamental concepts in systems biology. Topics vary from year to year. (SP) Lim

248. Comparative Physiology and Endocrinology Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly Biology 221. Reviews and reports of current research in vertebrate endocrinology and physiology. (SP) Firestone

249. Seminar on Evolutionary Genetics. (1) Course may be repeated for credit. One hour of discussion per week. Prerequisites: Consent of instructor. This course focuses on evolution in the field of systems biology with particular emphasis on gene regulation and cell biology. The course covers the critical analysis of primary research data, computational modeling, and integrates fundamental concepts in systems biology. Topics vary from year to year. (SP) Lim

250. Seminar in Ecology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 153. Readings and discussion of current topics. (F,SP) Staff

251. Ecological Research Reviews. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly 254. Reports and discussions of original research in the field of systems biology. (SP) Staff

257. Current Topics in Behavioral Physiology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: C144 or consent of instructor. Course topics change each semester. (SP) Staff

259. Advanced Paleocology. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Topics vary from year to year but will include paleocology of major groups of organisms and major environmental sequences. Focuses on population, community evolutionary, or taxonomic perspectives.

262. Seminar in Computational Biology. (1) Course may be repeated for credit. One hour of lecture and one hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Students will discuss original papers in the general area of computational biology and will discuss new papers by instructors in the course and by invited speakers from other departments at Berkeley and from other universities and research groups. (F,SP) Hulsenbeck, Nielsen, Statkin

263. Genetics and the Evolution of the Skeletal. (2) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Consent of instructor. Formerly Zoology 260. Presentation of results of original research by students, faculty, and visitors. (SP) Staff

266. Seminar in Evolution above the Species Level. (2) Course may be repeated for credit. Two hours of seminar per week. Formerly Paleontology 246. Current issues in macroevolution and paleobiology, using both neontological and palaeontological data. Offered alternate years. (F,SP) Padian

286. Seminar in Vertibrate Evolution and Paleontology. (2) Course may be repeated for credit. One hour of seminar per week. Prerequisites: 183, 183L or consent of instructor. Presentations and discussions of original research in vertebrate evolution and paleontology. Syllabus and reading list will vary as topics change from semester to semester. Open to graduate students with permission. Enrollment limit: 20. (F,SP) Padian

296. Seminars in Paleontology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 250. Advanced study and current literature in various fields of paleontology. Topics vary from year to year. (F,SP) Staff

299. Research Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Botany 290 and Zoology 290. Advanced study in various fields of integrated biology. Topics announced in advance of each semester. Enrollment in more than one section permitted. (F,SP) Staff

301. Research Seminar. (1) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly Botany 290 and Zoology 290. Advanced study in various fields of integrated biology. Topics announced in advance of each semester. Enrollment in more than one section permitted. (SP) Staff

305. Academic Survivorship. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Series of workshops and seminars for graduate students and faculty participation. The main objective of these courses is to train graduate students to become effective instructors and to discuss important issues that graduate students face when teaching undergraduate classes. (F,SP) Staff

306. Dissemination of Research: Your Interface with the Public. (2) Two hours of seminar per week. This course will consist of lectures and class discussions about mechanisms of communicating about science to the public. We will consider how to convey the issues, process, and findings of scientific research to a variety of audiences using different media (e.g., posters, web pages, newsletters, newspaper and magazine articles, books, television). Projects conducted by teams of students under the direct supervision of the instructors will include preparation of outreach materials (e.g., posters, newsletters, web pages).

307. Teaching Colloquium: Graduate Student Instructors. (1) Two lecture plus workshops per week. Must be taken on a satisfactory/unsatisfactory basis. Series of workshops and seminars involving graduate students and faculty participation. The main objective of these courses is to train graduate students to become effective instructors and to discuss important issues that graduate students face when teaching undergraduate classes. (F,SP) Staff

323. Integrative Biology Colloquium. One hour of meeting per week. Formerly Botany 280. Meetings for the presentation of original work by faculty, visiting lecturers, and graduate students. (F,SP) Staff

326. Special Study for Graduate Students. (1-4) Course may be repeated for credit. Individual conferences. Formerly Zoology 296. Reading or other advanced study by arrangement with a staff member. (F,SP) Staff

327. Directed Field Studies. (1-8) Course may be repeated for credit. Field work. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 297. Open to qualified students directly engaged in field studies. (F,SP) Staff

328. Special Study in Integrative Biology. (1-12) Course may be repeated for credit. Hours to be arranged. Prerequisites: Consent of instructor. Formerly Physiology 298 and Anatomy 298. Graduate research by small groups. (F,SP) Staff

329. Graduate Research. (1-12) Course may be repeated for credit. Individual study. Must be taken on a satisfactory/unsatisfactory basis. Formerly Botany 299, Paleontology 299, Physiology 299, Anatomy 299, Zoology 299. Credit awarded according to work planned and accomplished. (F,SP) Staff

601. Individual Study for Master’s Students. (1-8) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 601, Zoology 601. Independent study for the comprehensive requirements in consultation with the major adviser. Units may not be used to meet either unit or residence requirements for a master’s degree. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Formerly Paleontology 602, Zoology 602, Physiology 602, Zoology 602. Individual study in consultation with the major adviser. Intended to provide an opportunity for qualified students to prepare themselves for the various examinations required for candidates for the Ph.D. (F,SP) Staff

Professional Courses

303. Teaching Colloquium: Graduate Student Instructors. (1) Two lecture plus workshops per week. Must be taken on a satisfactory/unsatisfactory basis. Series of workshops and seminars involving graduate students and faculty participation. The main objective of these courses is to train graduate students to become effective instructors and to discuss important issues that graduate students face when teaching undergraduate classes. (F,SP) Staff

304. Dissemination of Research: Your Interface with the Public. (2) Two hours of seminar per week. This course will consist of lectures and class discussions about mechanisms of communicating about science to the public. We will consider how to convey the issues, process, and findings of scientific research to a variety of audiences using different media (e.g., posters, web pages, newsletters, newspaper and magazine articles, books, television). Projects conducted by teams of students under the direct supervision of the instructors will include preparation of outreach materials (e.g., posters, newsletters, web pages).

305. Academic Survivorship. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Series of workshops and seminars to prepare graduate students for many aspects of academic careers, including grant proposal writing, giving talks at meetings or to academic departments, preparing job applications and having job interviews, advising graduate students and postdocs, reviewing manuscripts and grant proposals, service activities and time management, working at teaching colleges versus research universities, alternative careers, etc.

400. Training in Stable Isotope Methods and Mass Spectrometry. (1) Three hours of lecture and labo

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&Q requirement
AC suffix=course satisfies American Cultures requirement

†Recipient of Distinguished Teaching Award
A minimum of 20 upper division units (at least six courses) drawn from at least three fields or disciplines. Examples of research areas available on the ISF website or in the ISF Student Handbook.

Core theory and methodology courses. Students in the major must take ISF 100A, Introduction to Social Theory and Cultural Analysis. In addition, students must take one of the following courses: 100B, Introduction to Social Theory and Cultural Analysis; 100C, Word and Image; 100D, Introduction to Technology, Society, and Culture; 100E, The Globalization of Rights, Values, and Laws in the 21st Century; or 100F, Thinking Beyond Capitalism: Theories, Controversies, and Interpretations.

Thesis requirement. ISF 190, Senior Thesis. Research and writing of a senior thesis (30-40 pages) that pertains to the student’s area of research.

Thesis requirement in the Honors Program. ISF H195, Senior Honors Thesis. Requirements for graduation in the Honors Program include: (1) 3.5 overall GPA and 3.6 in ISF, and (2) successful completion of honors thesis (60-80 pages). Honors candidates will submit to their thesis advisers a detailed research proposal with a substantive bibliography. Honors candidates will also contact an additional Berkeley faculty member or an appropriate member of the ISF advisory board for purposes of reading and evaluating the completed honors thesis.

Lower Division Courses

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/not passed basis. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered by all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP)

60. Technology and Values in the Global Arena. (3) Three hours of lecture per week. In recent years, the pace of international transfers of technology, funds, resources, information, and even populations has increased dramatically. This cross-cultural diffusion has raised complex and interesting moral issues, issues with which this course seeks to explore. We will examine some of the emergent ethical issues in international affairs, with particular attention to those involving technological development. Such issues include the impact of mass media and the Internet on cultural integrity, the politics of environmental regulation, ethical implications of genetic engineering, and others. In each case, the student will explore different historical perspectives on such issues in the context of different societies.

61. Moral Reasoning and Human Action: The Quest for Judgment. (3) Three hours of lecture per week. This is an interdisciplinary survey course that seeks to understand how we define justice, evil, and individual responsibility in modern society. In particular we are going to probe carefully how humans reflect on and practice the moral process of reasoning. We will focus on human behavior in extreme situations, like war, life and death conflicts, genocide and mass killing, as well as competing conceptions of human freedom. The course has a distinctive dual purpose. On the one hand we want to encourage students to develop critical thinking skills. This includes the ability to systematically evaluate information and competing moral claims. Also, it is intended as an exposure to the interdisciplinary approach. That is, how can different perspectives illuminate the same issue? With this in mind the

interdepartmental studies (special studies)

Interdepartmental studies courses are sponsored by two or more departments because the content of each course transcends the boundaries of individual departments. Each class is taught by one or more instructors who represent the departments sponsoring the class. For further information, contact the sponsoring departments.

Note: Many IDS courses that formerly appeared in this section are no longer taught and have been withdrawn. Some of them, however, have equivalents that are now listed in the sponsoring departments. See individual department course listings for further information.

interdisciplinary studies

Field Major Office: Undergraduate and Interdisciplinary Studies, 231 Evans Hall, (510) 643-7691 ugis.berkeley.edu/isf

Director: Renate Holub, Ph.D.

Professors
Renate Holub, Ph.D. (Interdisciplinary Studies/European Studies/Intelectuals and Global Studies) Richard E. Hutson, Ph.D. (English/Preanalytic/Cultural Studies/Animal Studies) Karin L. Sanders (Scandinavian) Paul Thomas (Political Science) Richard Walker (Economic and Urban Geography)

Lecturers
Rakesh Bhandari, Ph.D. Robert Ehrlich, Ph.D. Earli Klee, Ph.D. Clare Talwalker, Ph.D. Gary P. Wren, Ph.D.

Honors Thesis Affiliated Faculty

Student Academic Adviser: Dawn Strough

The Interdisciplinary Studies Field (ISF) Major

The ISF major offers students the opportunity to develop an individualized research program. With the help of an ISF faculty advisor, students may use courses from the social sciences, the professional schools and colleges, or the humanities in order to pursue their research. Typically, students select courses from three disciplines. In addition, the ISF major offers a capstone experience in that all students will write and research a substantive thesis. The research program must meet three criteria:

1. It must be interdisciplinary. This means that the research area must integrate approaches from at least three disciplines. The principle of integration can be comparative, transnational, historical, geographic, or thematic.

2. The research area must not replicate an existing major. The purpose of the ISF major is to enable research interests of undergraduates in areas in which no formal program exists.

3. The area of research must be feasible. Each student’s proposed research program must be discussed with a faculty advisor to make sure that the range and number of courses required will be available.

The field major is administered by a faculty advisory committee and is one of the programs of the Office of Undergraduate and Interdisciplinary Studies.

Note: Visit ISF.berkeley.edu/ugis/isf for the most up-to-date information about the major.

Admission to the Major.

Students should apply to the major before or during the first semester of their junior year. Students will be considered for the ISF major on the basis of the appropriateness of their proposed area of research, the quality of their previous work in relevant courses, and their overall promise for interdisciplinary work. Candidates for the major should discuss their individual research proposal with an ISF faculty member before submitting an application. Applications will be accepted throughout the semester.

Lower Division Requirements.

One year (two courses) of world civilization. Courses that may be used to fulfill the requirement are listed in the ISF Student Handbook, available on the ISF website or outside 235 Evans Hall. World civilization equivalents may be discussed with ISF faculty advisors. The world civilization requirement must be taken for a letter grade.

Upper Division Requirements. 30 units distributed among the following:

Area of research. 20 upper division units (at least six courses) drawn from at least three fields or disciplines. Examples of research areas available on the ISF website or in the ISF Student Handbook.
course draws on important work from philosophy and ethics, social psychology, jurisprudential analysis, historical-political accounts, and personal memoirs.

62. Representations of Self-Deception in the Modern World. (3) Three hours of lecture per week. In this course, we will work in the humanities and the social sciences in order to explore a number of dimensions of self-deception in the modern world. The focus will be upon the willingness to falsify both personal and public events in order to maintain one’s position in the modern sphere. This course will begin with an examination of the psychological dimension, emphasizing the importance of the nature of unconscious experience. In this context, we will examine how self-awareness is shaped by personal relationships, especially family arrangements. In addition, we will look at the manner in which people often perform in acts of self-deception with reference to the political realm.

98. Directed Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to three hours of lecture per week. Must be taken on a passed/not passed basis. Seminars for the group study of selected topics not covered by regularly scheduled courses. Topics will vary from semester to semester.

Upper Division Courses

100A. Introduction to Social Theory and Cultural Analysis. (4) Three to four hours of lecture and up to one hour of discussion per week. This course draws on the works of key figures in social theory and contemporary analysis to examine the basic conceptual underpinnings of modern societies. That is, we explore what it means to live in the modern, postmodern, hypermodern, or global worlds. In particular, we examine the nature of industrial and post-industrial social formations, cultural perceptions, and the development of ideological constructs. Changing understandings of power and domination is a central linkage tying these various analyses together. We are particularly interested in charting the relationship between quickly shifting social changes on a local and global level and competing theoretical interpretations of their meaning. (F,SP)

100B. Introduction to Social Theory and Cultural Analysis. (4) Three to four hours of lecture and zero to one hours of discussion per week. This is a course exploring how we understand the idea of the self in contemporary social worlds. The course shares the presumption that the modern self is a created endeavor. It charts traditional and contemporary understandings of individual identity, the maturation process, and the nature of an inner life, the concepts of freedom and individual agency, the force of evolution and heredity, and the influence of social causation. The course stresses the complex interplay between the self, society, and culture. It also considers the nature of power and domination. (F,SP)

100C. Word and Image. (4) Three hours of lecture per week. This course is designed to sharpen our skills in understanding what happens when the world of images meets the world of text. Starting with works from the "classical" tradition, we will proceed to investigate how word/image constellations operate in a variety of media, including sculpture and poetry, painting and performance, music and dance, travelogues, autobiographies, novels, and diaries, photography, silent movies, and advertising. (F,SP)

C100C. Word and Image. (4) Three hours of lecture per week. This course is designed to sharpen our skills in understanding what happens when the world of images meets the world of text. Starting with works from the Western "classical" tradition, we will proceed to investigate how word/image constellations operate in a variety of media, including sculpture and poetry, painting and performance, music and dance, travelogues, autobiographies, novels, and diaries, photography, silent movies, and advertising. Also listed as Scandinavian C114. Sanders

100D. Introduction to Technology, Society, and Culture. (4) Three to four hours of lecture and zero to one hour of discussion per week. This course surveys the technological revolutions of the 19th and 20th centuries, then focuses on the development of the computer and the Internet. The final part examines the impact of the Internet on social movements. (F,SP)

100E. The Globalization of Rights, Values, and Laws in the 21st Century. (4) Four hours of lecture/discussion per week. This interdisciplinary course is an introduction to the complex interplay of transnational organizations and national institutions that increasingly govern social, cultural and geopolitical interactions in our contemporary world. Theoretical and methodological tools from the social sciences will be used. Prerequisite: One course in the analysis of these interplays. A study of rights and norms presupposes not only an understanding of the empirical evolution of rights traditions (including continental, common law, and indigenous traditions), but also a comprehension of the rationality, politics, and power of the agents who have made such a development possible. The course will provide students with an opportunity to place emerging transnational rights traditions into a historical and geopolitical framework. (F,SP)

100F. Theorizing Modern Capitalism: Controversies and Interpretations. (4) Four hours of lecture per week. This course explores how the various ways the nature and trajectory of modern capitalism has been interpreted. Our stress will be on post-Marxist works of analysis. The initial focal point will be on the work of Max Weber and Joseph Schumpeter, as well as important current debates in economic history and social theory generated by their work. Both Weber and Schumpeter display a strong fascination and elaboration with the work of Marx. The way they analyze Marx is revealing about the way contemporary analysts seek to understand the capitalist system. We will also consider a number of current debates that look at the systematic nature of capitalism. In particular, we are interested in how economic historians now see the development of capitalism. We also want to examine the Weberian tradition in terms of the changing shape of economic behavior. Debates about the nature of globalization will also be considered as well as analysis of the changing nature of work. (F,SP) Klee

C101. Economic Geography of the Industrial World. (4) Students will receive no credit for C101 after being awarded economics C101 or Interdisciplinary Studies 100A. Three hours of lecture and one hour of discussion per week. Prerequisites: Geography 20 or prior courses in economic or regional development. The purpose of specialization, economic growth and economic development. The study of rights and norms also requires an exploration of the geographical and cultural landscapes of power and domination. The study of rights and norms due to the formation of supra-national institutions and organizations in the 20th century (UN, UNESCO, GO’s, etc.). The course will provide the students with an opportunity to place emerging transnational rights traditions into a historical and geopolitical framework. (F,SP)

C111. The Globalization of Rights, Values, and Laws in the 21st Century. (4) The course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Declared ISF majors only. This is a recommended course for ISF majors. Students will develop a proposal for the senior thesis, locate research sources on campus, engage in preliminary research on the topic, and develop a preliminary but solid bibliography.

118. The Information Revolution in Business and Society. (3) Three hours of lecture per week. Prerequisites: Upper-level undergraduates. In the last decade, information technology (IT) has moved from a supportive role to a critical role in the success of many businesses. This course will explore the technological, economic, and social innovations that have made such “killer apps” possible. Students will learn how to think strategically and entrepreneurially about IT, whether for personal, business, or nonprofit applications.

188. Preliminary Thesis Preparation. (2) Two hours of lecture/discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Declared ISF majors only. This is a recommended course for ISF majors. Students will develop a proposal for the senior thesis, locate research sources on campus, engage in preliminary research on the topic, and develop a preliminary but solid bibliography.

189. Introduction to Interdisciplinary Research Methods. (3) Three hours of seminar per week. Prerequisites: interdisciplinary studies field majors and ISF majors. This course serves as an introduction to interdisciplinary quantitative and qualitative research methods. It will enable the students to deepen and clarify their research topics and to tailor their methodological approaches to their disciplinary inclinations. They will build a grounded bibliography on their research topic and acquire the skills to survey the basic conceptual and theoretical arguments on their particular topic. By the end of the semester, they will have written a critical survey of the literature on their topic which will serve as the introductory chapter to the thesis. Students who write honors theses will also contact faculty on campus who have expertise in the students' research area. (F,SP)

190. Senior Thesis. (4) Two hours of seminar per week plus individual conferences. Prerequisites: Senior standing; completion of ISF core courses; declared in the major. The preparation and presentation of a senior thesis pertaining to the student’s individual area of concentration within the interdisciplinary studies field major. (F,SP)

H195. Honors Thesis. (4) Two hours of seminar per week plus individual conferences. Prerequisites: Senior in the honors program; completion of ISF core courses; declared in the major; consent of the ISF faculty. Entails writing a bachelor’s thesis pertaining to the student’s individual area of concentration within the interdisciplinary studies field major. The completed thesis will be read by the thesis adviser and one other faculty member. (F,SP)

197. Field Studies. (1-4) Course may be repeated for credit. Individual meetings. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing, declared in the interdisciplinary studies field major, and consent of instructor. Supervised experience relevant to the student’s specific area of concentration in the interdisciplinary studies field major in the field of study. Students will complete individual meet- ings with faculty sponsor and written reports required. (F,SP) Ehrlich, Holub, Klee, Wren

198. Directed Group Study for Advanced Under- graduates. (1-3) Course may be repeated for credit. Conferences. Must be taken on a passed/not passed basis. Prerequisites: Participation in the College of Letters and Sciences. Formerly Social Sciences 198 and Humanities 198. Seminars for the group study of selected topics not covered by regularly scheduled courses. (F,SP) Summer Semester.

B prefix=language course for business majors
C prefix=course list course
H prefix=honors course
R prefix=course satisfies R & C requirement
W prefix=online course
"Professor of the Graduate School"
†Recipient of Distinguished Teaching Award
International and Area Studies
(Graduate Division)

Program Office: 101 Stephens Hall, isma@berkeley.edu, (510) 642-4466
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Chair: Nezar AlSayyad (Architecture)

GPP Minor Office: 100 Blum Hall, gppminor@berkeley.edu, (510) 642-0885
Chair: Ananya Roy (City and Regional Planning)

Overview
The International and Area Studies (IAS) Program attempts to enhance the educational experience at the undergraduate and graduate levels. The courses IAS offers are interdisciplinary, internationally focused, and address timely and relevant issues not generally covered in existing courses. The program is well suited for students interested in understanding the ethics of global citizenship and the role that Berkeley undergraduates play in understanding international issues and/or detailed knowledge of their degree program. It provides the theoretical frameworks, methods and skills, and creative opportunities necessary for students to participate in forms of practice in imaginative and practical ways that express the ethics of globalization and the role that Berkeley undergraduates play in understanding and addressing some of the most pressing issues of the 21st century. Students from all disciplines are encouraged to undertake the minor.

Eligibility. All currently matriculated undergraduate students are eligible to apply. Students must be able to demonstrate their ability to complete all minor requirements within the established unit norms for their degree program. Courses. The minor is organized around core and elective course requirements. In addition to the practice that is comprised of a field experience and a reflection course. The requirements must be completed in the following sequence: (1) IAS/CP 115. Global Poverty: Challenges and Hopes in the New Millennium; (2) IAS 105, The Ethics, Methods, and Pragmatics of Global Practice; (3) Practice experience; and (4) Reflection Course (IAS 196). Elective courses may be taken at any time during that sequence, but will most benefit students if taken prior to the practice experience. In addition, two directed electives, one on global and area studies and one on professional practice, are chosen in consultation with a faculty adviser. The program is completed when the student engages in a research or practice component and submits a final field report.

How to Apply. Students must submit a Minor Declaration form. Deadlines are mid-October and April 1 (or the closest business day preceding). For more information, visit blumcenter.berkeley.edu/global-poverty-education/global-poverty-minor.

Lower Division Courses

20. Perspectives in International Education. (2) Three hours of lecture per week for eight weeks. Must be taken on a passed/not passed basis. Prerequisites: Freshman or sophomore standing. This course will examine developments in the field of international education in light of the acceleration of the globalization of economies and the internationalization of cultural flows since the 1980s. In this context, the course will explore cross-cultural issues, economic trends, gender questions, and political considerations as they impinge upon international education programs. Particular attention will be given to the UC Education Abroad Program as a means of understanding the structure, scope, rationale, and characteristics of con-
to provide students with the background and knowledge to undertake projects/work experience of a global scope and to understand the ethics of global service and practice. Each student will be required to complete a major project beginning with the conceptualization of the problem through dissemination of project results. (F,SP) Staff

105B. The Ethics, Methods, and Pragmatics of Global Practice. (2) Students will receive no credit for 105B after taking 105. One- and one-half hours of seminar per week. Prerequisite: Consent of instructor. This course is designed as a comprehensive overview of the ethics of global service and practice. Each student will be required to complete a major project beginning with the conceptualization of the problem through dissemination of project results. (F,SP) Staff

106. Intermediate Microeconomic Theory. (4) Students will receive no credit for 106 after taking Economics 100A, 101A. Business Administration 110A, Undergraduate Business Administration 101A, and Environmental Economics and Policy 100. Three hours of lecture and one hour of discussion per week. Prerequisite: Consent of instructor. This course is designed as a comprehensive overview of intermediate microeconomic theory. It covers a number of topics including consumer and demand theory, firm, perfect competition, imperfect competition, and market theory, and imperfect competition, welfare economics, choice under uncertainty and information. All analysis conducted in the course relies on graphical and algebraic techniques. Discussion sections will demonstrate the behavioral models covered in class to topics with an international dimension, such as the setting of tariffs, cartel behavior, and international trade. (F,SP) Althammer

107. Intermediate Macroeconomic Theory. (4) Students will receive no credit for 107 after taking Economics 108B, 101B, Business Administration 111, Undergraduate Business Administration 101B. Three hours of lecture and one hour of discussion per week. Prerequisites: Economics 1 or equivalent. This course is designed as a comprehensive overview of intermediate macroeconomic theory focusing on economic growth and international economics. It covers a number of topics including history of economic growth, industrial revolution, post-industrial revolution divergence, flexible- and sticky-price macroeconomics, and macroeconomic policy. Course is structured for majors in international and area studies and other non-economic social science majors. (F,SP) Hsieh

115. Global Poverty: Hopes and Challenges in the New Millennium. (4) Three hours of lecture per week. This class seeks to provide a rigorous understanding of 20th-century development and thus 21st-century poverty-alleviation. Students will take a look at popular ideas of poverty-alleviation, the institutional framework of poverty ideas and practices, the social and political mobilizations that seek to transform the structure and content of poverty alleviation. (F,SP) Roy

C118. Introductory Applied Econometrics. (4) Hours of lecture and one hour of discussion per week. Prerequisites: Statistics 2 or equivalent. Formulation of a research hypothesis and definition of an empirical strategy. Regression analysis with cross-sectional and time-series data; econometric methods for the analysis of qualitative information; hypothesis testing. The techniques of statistical and econometric analysis are developed through applications to a set of case studies, and real data from government resources, and international development economics. Students learn the use of a statistical software for econometric data analysis. Also listed as Environmental Economics 124 and Policy Planning and Development 124. (SP) Roy

120. Selected Topics. (3) Course may be repeated for credit. Three hours of lecture per week. Interdisciplinary study of selected topics in international and area studies. Each offering focuses on problems and issues of international concern in greater depth than can be accomplished in a general topic lecture course. Through the use of lectures, discussions, and multimedia presentational methods, a variety of perspectives relating to the subject matter of the course. Students will be expected to successfully complete various writing assignments or short projects and written exams. Instructor and topic vary from term to term. (F,SP)

140. Special Topics. (2) Course may be repeated for credit. Three hours of lecture every other week. Prerequisites: Consent of instructor. A short course designed to provide a vehicle to take advantage of unique visitor opportunities. Visitors come with considerable expertise in areas of interest to international and area studies. Topics will vary from semester to semester. (F,SP)

C145. Multicultural Europe. (4) Three hours of lecture per week. Formerly Interdisciplinary Field Studies 145. In this course, we will trace some of the substantive changes and transformations taking place in contemporary Europe in the areas of culture, society, and politics. In particular, we will look at the effects of massive migration flows—due to globalization processes—on the national culture of the core countries and examine the ways in which particular national cultures react to the increasing multiculturization of European life. The goal of the course is to familiarize students with a variety of cultural, social, and political innovations that accompany the formation of multicultural Europe. This involves: (1) an examination of the traditional concepts of citizenship and citizenship and (2) a study of the Europeanization of culture. Also listed as Geography C152, History C176, and Interdisciplinary Studies Field Maj C145.

150. Advanced Studies in International and Area Studies. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Advanced multidisciplinary research in current issues and topics in international and area studies. Course will focus on specific issues or geographical areas with a comparative approach included. A major research project is required as well as class presentations. Topics change each semester. (F,SP)

171. Internship in Agroecology and Sustainable Development. (4-8) Course may be repeated for a maximum of 16 units. A short course on internships. Prerequisites: Junior or senior standing or consent of instructor. Students work in selected internships in nonprofit, government agencies, or farmer networks associated with the Brazilian Consortium on Agroecology and Sustainable Development. The purpose of the internship is to gain direct experience in agroecological techniques and methods, to achieve sustainable agriculture. Internships are approved in advance by the faculty coordinator with whom each student will be required to meet regularly and plan out complimentary readings and regular written reports. Work commitments will range between 180-360 hours depending upon the number of units undertaken and the length of the term enrolled. Final assessments will be based upon performance in the internship, quality of written reports, and a final assessment by the faculty coordinator. Internship is repeatable for up to 16 units. Enrollment is restricted to 10 students per term selected through a special selection process. See instructor for details. (F,SP)

172. Agroecology: A Brazilian Perspective. (4-8) Course may be repeated for a maximum of 16 units. Twelve to 24 hours of lecture/discussion per week. Prerequisites: Junior or senior standing or consent of instructor. Students participate in an internship at the Universidade de Campinas and Universidade Federal de Santa Catarina. Students participate in a combination of formal lectures, directed discussions based upon assigned readings, and presentations by subject experts and faculty members. Field site visits to local farms and agroecology centers will complement the classroom lectures and discussions. Final assessments will be based upon performance in the internship and multiple written reports connected to the various readings. Students will participate in
175. The Economics of Climate Change. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 106, 107, Economics 1, or equivalent. The course will start with a brief introduction and evaluation of the scientific aspects behind climate change. Economic models will be developed to analyze the impacts of climate change and provide and critique existing and proposed policy tools. Specific topics studied are impacts on water resources and agriculture, economic evaluation of impacts, optimal control of greenhouse gases, benefit cost analysis, international treaty formation, discounting, uncertainty, irreversibility, and extreme events. (F,SP) Altieri

C175. The Economics of Climate Change. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 106, 107, Economics 1, or equivalent. Formerly 175. The course will start with a brief introduction and evaluation of the scientific aspects behind climate change. Economic models will be developed to analyze the impacts of climate change and provide and critique existing and proposed policy tools. Specific topics studied are impacts on water resources and agriculture, economic evaluation of impacts, optimal control of greenhouse gases, benefit cost analysis, international treaty formation, discounting, uncertainty, irreversibility, and extreme events. Also listed as Environmental Economics and Policy C175. (F,SP) Aufhammer, Fisher

180. Current Issues in International and Area Studies. (2,3) Course may be repeated for credit. Two to three hours of lecture and seminar per week. Section 1 to be graded on a letter grade basis. Section 2 to be graded on a passed/not passed basis. This course provides an opportunity to study and discuss issues and events of current international interest. The course will present a multidisciplinary perspective on specific subjects with the intent of linking students with the scholarly and scholarship involved in understanding and explaining current international issues, events, and crisis. The subjects will vary from semester to semester. Students may enroll in the lecture only for 2 units or may enroll in the lecture and discussion seminar for up to 4 units. One hour of seminar per week. (F,SP) Staff

194. Senior Seminar in International and Area Studies. (4) Three hours of lecture per week. Interdisciplinary research seminar for students in IAS majors. Intensive writing on research questions in social science and public policy best approached from an interdisciplinary perspective. Course aims to integrate knowledge of central focus or topic of course. Weekly discussions and critiques of readings and assignments. Final paper or project required. Topic must be approved by instructor. Topic varies from term to term. (F,SP) Staff

196. Special Field Research. (2-6) Course may be repeated for a maximum of 8 units. 90 to 270 hours of work per semester plus scheduled meetings with faculty advisor. Prerequisites: Consent of instructor. Students to work in internships programs selected and approved in advance by the faculty advisory committee and for which volunteer agreements have been established between the sponsoring organization and the student. Students are expected to produce two brief progress reports for their faculty advisor during the course of the internship, as well as produce a final capstone piece for the course consisting of no fewer than 25 double spaced pages. Grade will be assigned A-F and judged on the same scholarly merits as a seminar or honors course. If taken on a passed/not passed basis, the established C+ standard will apply. The course is open to students in the poverty and practice minor. Other international area studies majors may enroll if approved by their respective faculty chair. (F,SP) Staff

197. Field Studies. (1-4) Course may be repeated for credit. Individual meetings. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised experience relevant to specific aspects of international and area studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings. Must be taken on a passed/not passed basis. Student initiated course, the content of which is approved by faculty in charge. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (4-8) Course may be repeated for credit. One to three hours of independent study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Written proposal must be approved by a faculty advisor. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP)

200. Seminar in Portuguese Studies. (1) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Consent of instructor and graduate-level standing. This course is designed to accommodate cross-listed courses offered through transfers and to help identify courses that are applicable to the graduate program in international and area studies. Topics vary from course to course. (F,SP)

202. Seminar in Portuguese Studies. (1) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Consent of instructor and graduate-level standing. This course is designed to accommodate cross-listed courses offered through transfers and to help identify courses that are applicable to the graduate program in international and area studies. Topics vary from course to course. (F,SP)

204. Supervised Independent Study and Research for Undergraduates. (4-8) Course may be repeated for credit. One to three hours of independent study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Written proposal must be approved by a faculty advisor. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP)

Graduate Courses

202. Seminar in Portuguese Studies. (1) Course may be repeated for credit. One hour of seminar per week.Prerequisites: Consent of instructor and graduate-level standing. This course is designed to accommodate cross-listed courses offered through transfers and to help identify courses that are applicable to the graduate program in international and area studies. Topics vary from course to course. (F,SP)

205. Rotary Peace Fellows Seminar. (2-4) Two to three hours of seminar per week. Graduate seminar specifically focused on understanding the resolution of conflict, human rights, and other topics relevant to the scope of study represented by the Rotary Peace Fellows. Seminars will include weekly meetings, readings, presentations, and discussions. Assignments will include both individual projects and group projects of appropriate scope and depth reflective of unit value of each offering. (F,SP) Staff

271. Internship in Agroecology and Sustainable Development. (4-8) Course may be repeated for a maximum of 16 units. Twelve to 24 hours of internship per week. Prerequisites: Graduate standing or consent of instructor. Students work in selected internships in nonprofit, government agencies, or farmer cooperatives associated with the program on Agroecology and Sustainable Development. The purpose of the internship is to gain direct experience in agroecological techniques and methodologies to achieve sustainability in agriculture. Students are approved in advance by the faculty coordinator with whom each student will be required to meet regularly and plan out complementary readings and regular written reports. Work commitments will range between 180-360 hours depending upon the number of units undertaken and the length of the term enrolled. Final assessments will be based upon performance in the internship, a reflective paper, and an oral assessment by the faculty advisor. Internship is repeatable for up to 16 units. Enrollment is restricted to 10 students per term selected through a special selection process. See instructor for details. (F,SP) Altieri

292. Directed Advanced Research. (2-4) Course may be repeated for credit. Individual weekly meetings. Prerequisites: Consent of instructor and graduate-level standing. This course is intended to provide supervision in preparation of a major research paper on international and area studies. The topic should be agreed upon in advance by both the student and faculty supervisor and generally will be topics not covered in other existing coursework. (F,SP)

299. Directed Reading. (1-4) Individual weekly meetings. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor and graduate-level standing. This course is designed to accommodate cross-listed courses offered through transfers and to help identify courses that are applicable to the graduate program in international and area studies. Topics vary from course to course. (F,SP)
vide directed reading in subject matter not covered by available seminar offerings. (F.SP)

**Professional Courses**

300. Teaching Practicum in IAS. (1-4) Course may be repeated for a maximum of 12 units. One hour of consultation, three hours of lecture, and two hours of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor in one of the IAS Teaching Programs. Open to all GSIs teaching in IAS major programs. This course is intended to provide subject-specific academic preparation appropriate to discussion section teaching assignment. It will serve as a forum to discuss problems and create innovative solutions to these problems and focusing on course construction and operation, organizing syllabi, preparing lectures, devising written assignments, leading discussion sections, constructing evaluative mechanisms and grading strategies. Each section will focus upon the pedagogical issues specific to the course in which the student is teaching. Units will be assigned according to the percentage of appointment and the instructional workload assigned to the discussion sections. (F.SP) Staff

301. Professional Training: Teaching in IAS. (2) Course may be repeated for a maximum of 8 units. Required for graduate student instructors in IAS major programs for the first time, and is strongly recommended for all IASTP GSIs. Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor in one of the International and Area Studies Teaching Programs. This course is intended to prepare students from the various social science disciplines to be instructors in interdisciplinary/multi-departmental courses. It will serve as a forum to discuss problems and create innovative solutions to these problems. Students will be introduced to degree construction and operation, specialists from various disciplines will discuss strategies for moving outside of their areas of specialization and into broader areas of international and area studies. Graduate students will be provided training in building their own interdisciplinary courses from the ground up. Organizing syllabi, preparing lectures, devising written assignments, leading discussion sections, constructing evaluative mechanisms and grading them will all be covered over the course of the semester. (F.SP)

**Italian Studies**

(College of Letters and Science)

Department Office: 6303 Dwinelle Hall, (510) 642-2704 italian.berkeley.edu

**Professors**

Alberto Accordini, Ph.D. Cornell University, Medieval and Renaissance literature and culture
Barbara Spackman, Ph.D. Yale University, Late 19th- and 20th-century literature and culture, gender studies, literary and cultural theory, comparative literature
Louise George Clubb (Emeritus), Ph.D.
Gustavo Costi (Emeritus), Dottore in Filosofia
Anthony Newton (Emeritus), Ph.D.
Loren Partridge (Emeritus), Ph.D.
Nicolas J. Perella (Emeritus), Ph.D.
Ralph Starn (Emeritus), Ph.D.

**Associate Professors**

Steven Bottini, Ph.D. Cambridge University, Dante, literature and culture 1250-1550
Mia Fuller, Ph.D. University of California, Berkeley, anthroposophy and the cultural history of modern Italy, colonialism, architecture and urbanism
Gavriel Moses, Ph.D. Brown University, Italian film and cultural theory, 16th- and 17th-century literature, comparative literature
Mara Mauri Jacobsen, Ph.D. University of California, Berkeley, senior lecturer
Louise George Clubb, Ph.D. University of California, Berkeley, associate professor

**Senior Lecturer**

Catelyn R. Feucht (Emerita), B.A.

**Lecturers**

Anna Maria Bellezza, M.A. University of California, Berkeley
Mara Maun Jacobsen, Ph.D. University of California, Berkeley

Undergraduate Program Faculty Adviser:

Mr. Moses
Graduate Adviser: Ms. Fuller

**Department Overview**

The undergraduate program is designed to: (1) provide training to a high degree of fluency in reading, writing, and speaking Italian; (2) give students the opportunity for intensive study in Italian literature and culture from the Middle Ages to the present day; (3) introduce them as possible to the richness and variety of Italian experience past and present; and (4) extend their linguistic and literary training by exposing them to approaches drawn from other major programs in the major.

The graduate program offers in-depth training in the field of Italian studies, leading to the Ph.D. degree. Beginning with a strong foundation in the critical analysis and historical understanding of Italian literature, the program encourages exploration of a wide range of interdisciplinary areas, including but not limited to film studies; comparative literature; literary, rhetorical, and cultural theory; gender studies; history; anthropology; history of art and music; architecture; classics; political science; medieval and early modern studies; Romance languages and literature; and so on.

**The Major**

**Lower Division.** 20 units of Italian language courses to include Italian Studies 1, 2, 3, 4 (Elementary/Intermediate/Advanced Italian) or their equivalents in linguistic proficiency.

**Upper Division.** 32 units of upper division courses, to include Italian Studies 101A-101B, Advanced Grammar, Reading, and Composition; and Italian Studies 103, History of Italian Culture, or Italian Studies 104, Renaissance literature and culture. At least 10 units 20 units must be taken in residence. Up to 8 units of coursework with primary readings and discussion in English may be counted toward the major.

No more than 12 credits earned through education abroad programs may count toward upper division requirements. All courses for the minor must be taken on a letter-graded basis. A GPA of 2.0 is required in upper division courses used for the minor.

**Study in Italy**

Berkeley offers advanced students the opportunity of studying in Padua, Bologna, Rome, or Milan. The programs feature courses in several aspects of Italian language, culture, and history. The department recognizes many of these courses as satisfying requirements in the Italian studies curriculum. Students intending to use study abroad courses in this way should consult the undergraduate faculty adviser before departure. Details of the programs are available from Berkeley Programs for Study Abroad, 160 Stephens Hall, (510) 642-1356; or studyabroad.berkeley.edu.

The department also participates in the UC Berkeley Summer Sessions Program in Florence. This program offers Elementary Italian 1 and 2, which can be applied to the lower division language requirements for the major and the minor, as well as a course in Italian cultural history.

**Graduate Program**

The Department of Italian Studies offers an integrated M.A./Ph.D. program. The M.A. constitutes the first phase in a trajectory leading to the Ph.D. Applications are not accepted for the M.A. degree alone. Students holding a master’s degree in Italian studies and related fields from other institutions may be admitted directly to the second phase of the program, as described below.

**First Phase: Master of Arts in Italian Studies.**

Requirements: Completion of between 24 and 32 units, the latter of which must be in graduate seminars. The courses must include Italian Studies 205, 290A, and 290B. One 4-unit seminar course in each of at least three of four historical periods of Italian literature and culture: 13th-14th centuries; 15th-16th centuries; 17th-18th centuries; 19th-21st centuries. (This requirement is subject to waiver based on prior experience in equivalent courses). The exact number of units required for each student will be determined by the graduate adviser in consultation with the graduate committee at the time of enrollment, and will be based on a careful evaluation of the student’s prior training in the field of Italian studies. Students are required to demonstrate advanced reading skills in one language other than Italian and English that has a scholarly literature available to the student.

In the second year of this phase (end of semester 3, beginning of semester 4), students take a comprehensive written examination based on a reading list agreed upon by the student and the department. Upon completion of the written examination, achievement in coursework, and scholarship (attested by seminar papers) and, if applicable, achievement in teaching. Following successful completion of the M.A. phase of the program, students prepare a statement outlining plans for work in the second, doctoral phase of the program, and thereby formally request permission to proceed. More detailed information is available from the department.

**Second Phase: Doctor of Philosophy in Italian Studies.**

Requirements: Two to three years of coursework including Italian Studies 282, the exact number of units depending on the extent of the student’s preparation. During this phase, students develop special expertise in a primary field in Ital-
ian studies and a secondary field of Italian studies, prepare for an examination in their areas of specialization, and develop a dissertation topic. A provisional proposal must be submitted in Italian Studies 228 and submitted for approval. The prospectus tutorial, presentation, and approval usually takes place the semester preceding the one in which the qualifying examination is taken. The faculty reading includes both written and oral components based on detailed proposals submitted with bibliography for a primary field and two special topics including the prospectus material which have been approved by the graduate adviser. Students must also demonstrate advanced reading ability in at least two languages other than Italian and English. The degree is conferred upon approval of the completed doctoral dissertation. Detailed information is available from the department.

Ph.D. in Romance Languages and Literatures. Ph.D. in Romance languages and literatures with emphasis in Italian is also offered. For information, please see the Romance Languages and Literatures section in this catalog.

Lower Division Courses

1. Elementary Italian. (5) Five hours of lecture and one hour of laboratory per week. Basic grammar for beginners: part one. (F,S,P)

2. Elementary Italian. (5) Five hours of lecture and one hour of laboratory per week. Prerequisites: 1 or 14A. Basic grammar for beginners: part two. (F,S,P)

3. Intermediate Italian. (5) Five hours of lecture per week. Prerequisites: 2. Grammar review, reading, and written composition. (F,S,P)

4. Advanced Italian. (5) Five hours of lecture per week. Prerequisites: 3. Selected readings in modern Italian prose; a review of the essentials of grammar; written and oral compositions. (F,S,P)

RSA-RSB. Reading and Composition. (4,4) Three hours lecture/discussion per week. Prerequisites: UC Entry-Level Writing requirement or equivalent for RSA; RSB or equivalent for RSB. Reading and composition course based on works by Italians and foreigners about Italy and its culture and by Italians about their distinctive experiences of other cultures as tourists and emigrants. Works to be selected will be primarily chosen from among fiction and nonfiction narratives, both originally in English and translated into it. RSA satisfies the first half of the Reading and Composition requirement and RSB or equivalent satisfies the second half. (F,S,P) Staff

12. Advanced Conversational Italian. (3) Three hours of lecture/discussion per week. Prerequisites: 3 or equivalent, or consent of instructor. The course is designed to develop and enhance oral communication skills at an advanced level, by means of conversational practice, discussion of readings, student presentation or original material, and use of audiovisual materials and realia. (SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and from semester to semester. (F,S,P) Staff

30. Dante (in English). (3) Three hours of lecture per week. An introduction to Dante’s works in the cultural and historical context of the European Middle Ages. (F,S,P) Bottinell

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Section 1 to be graded on a letter-grade basis. Section 2 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from semester to semester. (F,S,P) Staff

10. Italian Culture (in English). (4) Three hours of lecture and one hour of discussion per week. Formerly 40A-40B. Introduction to Italian studies through selected topics and themes integral to the history, literature, and arts of Italy from Dante to Fellini. (F,S,P) Fuller

15. The Italian Renaissance. (3) Three hours of lecture and one hour of discussion per week. Interdisciplinary introduction to the Italian Renaissance through selected topics integral to the history, literature, and arts of Italy in the 15th and 16th centuries. (F,S,P) Ascoli, Bottinell

70. Italian Cinema: History, Directors, Genres, Introduction to Italian Cinema. (3) Course may be repeated for credit as topic varies. Three hours of lectures/discussion and two to three hours of film viewing per week. This course is a basic introduction to the history of Italian cinema. No prior knowledge of Italian cinema or film theory is necessary. We will analyze film as an artistic discourse in the context of Italian culture and history from 1895 to the present. The course is structured chronologically: we will begin with silent cinema, work our way through the 20th century, and end with contemporary cinema. All films attended will be in English with Italian subtitles. Films and film clips will also be shown during lectures. (F,S,P) Moses

98. Directed Group Study. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Topic study of selected topics not covered by regularly scheduled courses. (F,S,P) Staff

Upper Division Courses

101A-101B. Advanced Grammar, Reading, and Composition. (4,4) Three hours of lecture per week. Prerequisites: 4. Reading and grammatical analysis of representative texts; advanced written composition. (F,S,P) Staff

103. History of Italian Culture. (4) Three hours of lecture/discussion per week. Formerly 103A-103B. Introduction to the historical development of culture and literature in Italian from the Middle Ages to the present day. Lectures, critical analysis of texts, frequent writing exercises. In Italian. (F,S,P) Staff

104. Reading Italian Literature. (4) Three hours of lecture/discussion per week. Introduction to basic works of Italian literature (fiction, poetry, drama) with an emphasis on techniques of reading. (F,S,P) Staff


110. Literature and Culture of the 13th and 14th Centuries. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly 110A-110B. Emphasis on the literature and culture of the 13th and 14th centuries. Literature will emphasize the “Stil Novo” and Dante’s minor works as well as Boccaccio’s Decameron and Petrarch’s Rime. (F,S,P) Staff

112. Sixteenth-Century Literature and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly 112A-112B. Studies in the literature and culture of the High Renaissance and the Late Renaissance. (F,S,P) Staff

115. Nineteenth-Century Literature and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Three hours of lecture per week. The main trends in the fiction, poetry, prose and theatre of the 19th century. (F,S,P) Staff

120. Topics in Italian Studies. (4) Course may be repeated for credit as topic varies. Three hours of lectures, readings, and discussion per week on major authors, issues, and movements in Italian literature. (F,S,P) Staff

130A. Dante’s Inferno (in English). (4) Three hours of lecture per week. An introduction to Dante’s Inferno in the context of his other works. Taught in English. (F,S,P) Ascoli, Bottinell

130B. Dante’s Purgatorio and Paradise (in English). (4) Three hours of lecture per week. A closer introduction to Dante’s Purgatorio and Paradiso. Prior completion of Italian 130A Inferno is recommended. Taught in English. (F,S,P) Ascoli, Bottinell

160. Studies in the History, Society, and Politics of the Italian Peninsula. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. The course will study Italian culture from the perspective of social and historical forces, as articulated by a broad variety of cultural, ideological, and institutional discourses. (F,S,P) Staff

170. The Italian Cinema: History, Genres, Authors. (4) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. The course will study Italian culture from the perspective of literary discourse and will attend to a broad spectrum of Italian, ideological, and institutional forces. Taught in English or Italian. (F,S,P) Staff

175. Film and Literature (in English). (4) Course may be repeated for credit as topic varies. Three hours of lecture, two hours of film viewing, and two hours of video-production workshop per week. The interaction of film style with literary and poetic structure studied through film theories, film novels, and the work of outstanding Italian film directors. Literature shaped by film experience and films dealing with the essence of cinematic form will be analyzed. This course may fulfill the film major requirement in theory. (F,S,P) Moses

H195. Special Studies for Honors Candidates. (3) Individual conferences. Prerequisites: 3.5 overall GPA or 3.5 GPA in the major, and an overall 3.0 GPA in the major and a minimum of 18 upper division units in the major. Limited to senior honors candidates. Directed study relating to the writing of an honors thesis. (F,S,P) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Students must have completed 60 units and have a minimum GPA of 2.0. Supervised group study of topics not covered by regularly scheduled courses. (F,S,P) Staff

199. Supervised Independent Study and Research for Advanced Undergraduates. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Restricted to senior students with overall GPA of 3.0 or better. Enrollment restrictions apply; see the Introduction to the Course and Curricula section of this catalog. (F,S,P) Staff

Graduate Courses

200. Italian Stylistics. (2,4) Students taking course for 2 units do not write a final paper and may enroll in the course for no more than 6 hours of seminar per week. An introduction to practices of literary criticism through the posing of stylistic problems. Required of all Master of Arts candidates. (SP) Staff
C201. Linguistic History of the Romance Language. (4) Three hours of lecture per week. Prerequisites: Knowledge of at least two of the major Romance languages (French, Italian, and Spanish). Linguistic development of the major Romance languages (French, Italian, and Spanish) from the common Latin origin. Comparative perspective, combining historical and external history. Also listed as Spanish C202 and French C202. Staff

204. Contemporary Trends in Critical Theory. (2,4) Three hours of seminar and one hour of discussion per week. This course is designed to provide the student with a general view of the major developments in contemporary critical theory and to familiarize students with the use of critical methods to literary texts. One oral report and a final paper. Staff

205. Proseminar I: Italian Literary Studies. (2,4) Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Two hours of seminar and one hour of discussion per week. This course introduces the study of Italian literature in its historical scope, while presenting the range of research interests represented on the Italian Studies faculty. Required of all Master of Arts candidates. (F.SP) Staff

210. Seminar in Medieval Literature and Culture. (2,4) Course may be repeated for credit as topic varies. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Three hours of seminar per week. Formerly 207, 208, 211, 213. Investi- gation of major topics, genres, and authors in the vernacular and cultural history of Italy in the 13th and 14th centuries. (F.SP) Ascoli, Bottorff

212. Seminar on Dante. (2,4) Course may be repeated for credit when readings change. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Three hours of seminar per week. Formerly 209. Studies in the Commedia and other works. (F.SP) Ascoli, Bottorff

215. Seminar in Renaissance Literature and Culture. (2,4) Course may be repeated for credit when readings change. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Three hours of seminar per week. Formerly 217. Investigation of major topics, genres, and authors in Italian literature and culture of the 15th and 16th centuries. (F.SP) Ascoli, Moses

230. Seminar in 19th-Century Literature and Culture. (2,4) Course may be repeated for credit when readings change. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Three hours of seminar per week. Formerly 221. Investigation of major topics, genres, and figures in Italian literature and culture of the 19th century. (F.SP) Spackman

235. Seminar in 20th-Century Literature and Culture. (2,4) Course may be repeated for credit when readings change. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis. Three hours of seminar per week. Formerly 223. Inves- tigation of major topics, genres, and authors in Italian literature and culture of the 20th century. (F.SP) Spackman, Fuller

244. Special Topics in Genre and Mode. (2,4) Course may be repeated for credit as topic varies. Students taking this course for 2 units do not write a final paper and may enroll in the course on a satisfactory/un satisfactory basis and do not write a final paper. Three hours of seminar per week. Investigation of topics in Italian cultural history from a multidisciplinary perspective. (F.SP) Staff

260. Directed Readings in Italian Literature and Culture. (2) Course may be repeated for credit as topic varies. Assigned readings and one hour meeting per week. Program to be arranged for a satisfactory/un satisfactory basis. Prerequisites: Consent of instructor. Directed readings undertaken under the direction of a faculty member of the Department of Italian Studies. Must be taken with an audit of a 100-series seminar. (F.SP) Staff

270. Seminar Research Course. (1) Course may be repeated for credit as topic varies. Prerequisites: Con- sent of instructor. Directed research leading to the writing of a terminal paper. Admission by direction of a Depart- ment of Italian Studies faculty member. Requires concurrent enrollment in a 100-series seminar. (F.SP) Staff

280. Tutorial in Interdisciplinary Italian Studies. (4) Weekly meetings with professor. Prerequisites: Consent of instructor. Directed reading course com- bining elements of the student’s primary and sec- ondary fields of graduate study, culminating in the writing of a research paper. Course is required for all Doctor of Philosophy candidates. (F.SP) Staff

290A-290B. Graduate Colloquium in Italian Studies. (2,2) Course may be repeated for credit. M.A. or Ph.D. students who elect to repeat the sequence must do so on a satisfactory/un satisfactory basis. Two to three hours of colloquium per week. Section 1 to be graded on a letter-grade basis for M.A. students. Section 2 to be graded on a satisfactory/un satisfactory basis for Ph.D. students. Prerequisites: Graduate standing in Italian studies. Formerly 290. Reports on current scholarly work by faculty and graduate students. (F.SP) Staff

296. Special Study. (1-4) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of the instructor. Designed to allow students to do research in areas not covered by other courses. Requires regular discussions with the instructor and a final written report. (F.SP) Staff

299. Directed Research. (6-12) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/un satisfactory basis. Limited to students engaged in research for the doctoral disser- tation. (F.SP) Staff

601. Individual Studies for M.A. Candidates. (1-6) Course may be repeated for credit with consent of graduate advisor. May not be used for unit or resi- dence requirement for the master’s degree. Individual conferences. Must be taken on a satisfactory/un satisfactory basis. Individual study in consultation with a faculty member with a view to the M.A. comprehensive examination. May be taken only in the semester of the comprehensive examination. (F.SP) Staff

602. Individual Studies for Doctoral Students. (1-6) Course may be repeated for credit with consent of graduate advisor. Course does not satisfy unit or resi- dence requirements for doctoral degree. Individual conferences. Must be taken on a satisfactory/un satisfactory basis. Individual study in consultation with a faculty advisor. Intended to provide an opportunity for qualified students to prepare for the Ph.D. qualifying examination. May be taken only in the semester of the qualifying examination. (F.SP) Staff

Professional Courses

320. Practicum in College Teaching of Italian. (2,4) Course may be repeated for credit. Three hours of classroom teaching per week with regular super- vision; routine evaluation conferences. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: 301. Concurrent enrollment as an Italian graduate student instructor. (F.SP) Staff

323. Practicum in the Teaching of Italian Literature, History, and Culture. (2,4) Course may be repeated for credit. Three hours of classroom teaching. Must be taken on a satisfactory/un satisfactory basis. Prerequisites: Required of Department of Italian Studies GSIs not enrolled in 302 or 355 or in an approved Reading and composition pedagogy course. Three hours of classroom teaching per week with regular faculty supervision; attendance at faculty lectures where appropriate; no independent readings; courses in teaching and evaluate teaching methods, including lecturing, dis- cussion, classroom activities, grading and testing, design of syllabi and course materials. (F.SP) Staff

355. Seminar in Language Pedagogy. (4) Course may be repeated for credit. Two hours of seminar and three hours of demonstration per week. Prerequisites: Graduate student instructor status. Formerly 301. Required of all graduate student instructors in their first semester of teaching. This course provides instruc- tion in the professional practice of foreign language teaching and learning with lectures on methodology, testing, grading, class preparation, textbook selection and evaluation, course design and development, and the use of audio-visual materials to aid in instruc- tion. A final research paper is required. It also includes supervised classroom practice. (F.SP) Staff

Journalism (Graduate School of Journalism)

Office: 121 North Gate Hall, applyjs@journalism.berkeley.edu, (510) 642-3383

Dean: Neil Henry, M.A.

Professors
Lowell Bergman (The Reva and David Logan Distinguished Professor of Investigative Journalism), B.A. University of Wisconsin
Lydia Chavez, M.S. Columbia University Graduate School of Journalism. International reporting
Mark Danner, A.B. Harvard University. Foreign policy
William Drummond, M.S. Columbia University Graduate School of Journalism. Radio
Jon Elias, M.A. Stanford University. Documentary film
Thomas Goldstien, J.D. Columbia University. Law and ethics
Cynthia Gorney, B.A. University of California, Berkeley. Long-form writing
Neil Goodman (Dean), M.S. Columbia University Graduate School of Journalism. Africa, race relations, sports reporting
Thomas Leonard, Ph.D. University of California, Berkeley. University librarian
Michael Pollan (The John S. and James L. Knight Professor of Science and Technology), M.A. Columbia University. Environmental journalism
Ben H. Bagdikian (Emeritus), A.B. 
@David Littlejohn (Emeritus), Ph.D.
A. Kent MacDougall (Emeritus), M.S.
Brack S. (Emeritus), B.A.
Bernard B. Tapar (Emeritus), M.A.

Associate Professor
Carolyn Wakeman (Emerita), Ph.D.

Adjunct Professor
Ken Light, M.F.A. San Jose State University. Photojournalism

Senior Lecturers
Jean Biever (Associate Dean), B.A. Glacier College. Television journalism
Robert Calo, M.A. San Francisco State University. Television journalism
Paul Grabowicz (Associate Dean), B.A. University of California, Berkeley. New media reporting and production
Susan Rasky, M.A. London School of Economics. Political and urban reporting
James C. Spaulding (Emeritus) Andrew A. Stam (Emeritus)

Directors
Lowell Bergman (Investigative Reporting)
Lydia Chavez (Latin American Studies Concurrent Degree)
Desiree English (Magazine Center)
Paul Grabowicz (Multimedia)
Ken Light (Center for Photography) Susan Rasky (Political Reporting)

Graduate Program

The goal of the Graduate School of Journalism is to produce professional journalists who move on to positions of leadership and influence in American journalism. The Master of Journalism (M.J.) pro- gram provides intensive training in journalism skills while providing a knowledge of the underlying principles of the field. A professional project is required to com- plete the two-year program. The program is rooted in the idea that the best possible preparation for the practice of journalism is a sound liberal arts edu- cation followed by training in journalism at the
graduate level. Concurrent degree programs with law, Asian studies, international and area studies, Latin American studies, and public health are available.

The school offers courses in print, broadcasting, documentary film, radio, television, photography, and photojournalism. All students must take a focused and demanding core course that stresses writing and reporting skills. This is because the faculty believe that the best way to train students for careers in journalism is to place them under the supervision and guidance of seasoned journalists in small classes, give them informal feedback, and have them practice on a regular basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty mentor in a small-seminar setting. These seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Students are also required to take Journalism Law and Ethics and to complete a summer internship at a media outlet.

Beyond the core course, there are courses in specific areas such as political, business, environmental, community, science, international, and cultural reporting. There are also courses that focus on different techniques, such as investigative reporting and magazine reporting. The curriculum also includes courses in copyediting and photography and a sequence of courses in television and radio reporting.

Another group of courses is intended to increase understanding and practice of multimedia reporting. A host of web skills and software classes are offered to give student expert level training with these tools.

Candidates for the M.J. degree are expected to complete their work for the degree in four semesters. They must complete 36 units in approved upper division and graduate courses, of which at least 24 must be in journalism courses in addition to the ones in journalism, and must present an acceptable master’s project. Students are encouraged to take courses in disciplines other than journalism.

Applicants for graduate study should hold a bachelor’s degree comparable to that given by the University of California. Requirements and procedures are outlined in the brochure "Graduate Application for Admission and Fellowships," available at the Office of the Dean of the Graduate Division, and in the Announcement of the Graduate School of Journalism. Complete admissions information is available on the school’s website.

The Graduate School of Journalism also offers courses for undergraduates designed to give them insight into journalism.

For more information and application requirements, visit journalism.berkeley.edu/admissions/ request.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen. Course may be repeated for credit. The primary objective is to expose students to the discipline and breadth of journalism as applied to various fields. Students will learn why sound journalism is so important to a democratic society, what the role of journalists is, who profits by it, and what rules guide how reporters and editors work. Central issues affecting journalism, such as bias and professionalism, will be discussed. The class is not specifically intended for future journalists, but students will learn why pursuing a career in journalism can be so fulfilling and thrilling, as well as becoming better consumers of the news. Also listed as Media Studies C105. (F,SP) Staff

195W. Introduction to Opinion Writing: Walter Lippmann Meets the Blog. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Admission to UC Berkeley Washington Program. This course is designed to introduce students to the history and craft of modern opinion writing. Students will learn about the mechanics of producing columns and articles and how to develop their writing skills. The class will focus on the importance of writing clearly and effectively. This course is required for all participants in the Washington Program. (F,SP) Staff

196. Field Study in Journalism. (1-2) Course may be repeated for credit. Must be taken on a passed/not passed basis. Supervised experience in the practice of journalism in off-campus organizations. Individual seminars with meeting times and location vary. Field reports are required. For additional information, see Field Study and Internships. (F,SP) Staff

200. Reporting the News. (5-7) Five hours of seminar and 15 hours of fieldwork per week. This course is intended for journalism majors in their junior or senior years. It provides the foundation for the rest of the curriculum offered at the J-School. This course stresses hard news reporting, writing, and editing. In small groups, students will develop field stories with a focus on newspaper reporting work to develop the scope and quality of the reporting and writing ability of their students. The researching, reporting, rewriting, and editing schedule is extensive and students work on a range of stories covering a broad spectrum of subjects. The aim is to produce professional level work—publishable newspaper stories—in an environment and a timeline similar to a professional environment. (F,SP) Staff

201. Advanced News Reporting. (3-4) Course may be repeated for credit with consent of instructor. Three hours of seminar and eight hours of fieldwork per week. Must be taken on a satisfactory/unsatisfactory basis. Study of the principles and practice of newspaper editing, copyediting, headline writing, and makeup, with later emphasis on creative editing and critiques of student work. (F,SP) Staff

210. News Photography. (2) Two hours of lecture and four hours of laboratory per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Priority to journalism graduate students. Fundamentals of photography and taking photography. (F,SP) Staff

211. News Reporting Laboratory. (2-4) Two to four hours of lecture per week. This course is an intensive laboratory course taken in conjunction with our core reporting class, 200. It is designed to simulate as closely as possible the deadline and production pressures of a modern, multimedia newsroom environment. Students report to the newsroom during the week to receive their reporting assignments. Print, audio, and video elements are gathered, produced, edited, rewritten, and then made available to pre-selected media outlets for publication. Each section will produce a themed final project. (F,SP) Staff

212. Advanced Radio. (1-3) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion per week. Prerequisites: 275 or consent of instructor. Radio students may continue to develop their news and production skills in several formats: (1) the reporting and production of the weekly "Inside Oakland" program (broadcast on KALX-FM) — each episode explores a specific theme with focus on the geographic, cultural, and political entity known as Oakland; (2) the collaborative production of a documentary program focusing on a particular topic; and (3) the study and production of complex long-form pieces for broadcast on different outlets. (F,SP) Drummond

213. Documentary Photography. (3) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. An exploration of magazine and book photography as applied to photo essays, page assignments and book projects, as well as content based lectures (location lighting, environmental portraiture, etc.) and critiques. Students work on in-depth assignments that include reporting, research, and photography. Legal/ethical and business issues are
214. Photography Tutorial. (2-3) Two hours of lecture per week. This photo tutorial will emphasize the technical aspects in photography such as darkroom, lighting, composition, and color. Students will be working on weekly assignments as well as a final project which would directly correlate with the material covered in class as well as the requirements by the class. As an extension of this class, the instructor will encourage students to explore the darkroom and to improve not only their conceptual understanding of the medium, but also their technical, shooting, and critical thinking skills regarding photography. Some Photo-Shop tutorials will also be incorporated in the class for those students who are interested in learning digital photography and its possibilities. The sessions will cover scanning, resolution, and tools applicable to image manipulation, color correction, and output. This course and its content will be, of course, to a large extent determined by the questions raised by students, their levels of experience in the medium, as well as their final goals. (F,S) Chakarova

215. Multimedia Skills. (3) Three hours of workshop per week. This class teaches the fundamentals of using digital video, audio, and photo equipment, as well as editing digital files. The class is designed to extend students’ knowledge of how it is like to report in a multimedia environment. While primarily for students taking new media publishing courses, the class will be valuable to any student who wants to better prepare for the emerging convergence of broadcast, print, and web media. (F,S) Grabowicz

216. Multimedia Reporting. (2-3) Course may be repeated for credit with different topic and consent of instructor. Three hours of workshop per week. Prerequisites: 215 (can be taken concurrently); Dreamweaver, Premiere Pro or Final Cut Pro. For journalists, the Web opens a powerful way to tell stories by combining text, video, audio, still photos, graphics, and interactivity. Students learn multimedia-reporting basics, and the Web is changing from a format, and its relationship to democracy and community. Students use storyboarding techniques to construct nonlinear stories; they research, report, edit, and assemble multimedia stories. Prerequisites: Consent of instructor. (F,S) Staff

218. China’s Information Revolution. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. This course is about how to tap the power of the Internet to cover China. Students will take a critical and emerging role in the global community. Students will learn about the Web, its growth, its impact on China, and its relationship to democracy and communities. Students use storyboarding techniques to construct nonlinear stories; they research, report, edit, and assemble multimedia stories. (F,S) Rasky

224. Reporting on Social Issues. (3-4) Three hours of lecture and eight hours of fieldwork per week. Prerequisites: For journalism students, 200; all others consent of instructor. Work on an in-depth investigation of social problems in contemporary society, acquaintance with current developments in the social sciences relating to the problems, exposure to contrasting views, and writing of articles that will aid public understanding. (F,S) Staff

225. Science Reporting. (3-4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: For journalism students, 200 or equivalent; for others, consent of instructor. Advanced study of methods for reporting developments in such fields as science, education, health, or the environment. (F,S) Pollan

227. Reporting of Cultural Events. (3-4) Three hours of lecture/discussion and eight hours of fieldwork per week. Advanced study of reporting and critical writing in the field of arts. Students will become familiar with the fine arts, literature, and architecture. (F,S) Staff

228. Political Reporting. (3-4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: For journalism students, 200 or equivalent; for others, consent of instructor. Study and discussion of politics and practice in reporting political events and campaigns. (F,S) Rasky

230. Business Reporting. (3-4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: For journalism students, 200. Reporting and writing of business, financial, and consumer affairs. (F,S) Staff

231. Advanced Business Reporting. (3-4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: 200, 230, or consent of instructor. Advanced reporting and writing of business, financial, and consumer affairs. (F,S) Staff

234. International Reporting. (4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. This course is designed for students who are interested in foreign reporting. Course will include a broad overview of the issues that need to be researched when reporting on the foreign scenes and issues of a foreign country. Past classes have traveled to Mexico, China, Cuba, Hungary, Ghana, Hong Kong, India, Japan, Venezuela, Ecuador, and Peru. (F,S) Chavez, Wakeman

235. Covering Asia. (1,2) Two hours of seminar per week. This course will look at selected countries of Asia from the inside out and the outside in, with perspectives, analysis, and guidance from commentators here and abroad. Students will cover how to research and prepare for reporting; how to get to sources; how to assess risks in the field; and how to define and develop the story. Students will follow international news similar to those held by overseas correspondents and produce oral and written reports analyzing the coverage in various media. (F) Wakeman

236. China Reporting. (3) Three hours of lecture/discussion per week. An examination of the shifts in China’s changing cultural standards or its development in fields such as drama, film, music, fine arts, literature. (F) Staff

237. Reporting on Japan. (1,2) Course may be repeated for credit with different topic and consent of instructor. Two hours of seminar per week. Each semester, this course will focus on a different aspect of Japan. Among other topics, the class may discuss Japan’s changing cultural standards or its developing social problems, its political shifts or its history, the changing economy or the shifts in its regional relations and its global role. Through guest speakers, including noted experts, writers, businessmen, and diplomats—and roundtable discussions, students will develop a greater knowledge of the country for use when reporting on it. (F) Staff

242. Profiles. (3) Three hours of seminar per week. Prerequisites: 200 or consent of instructor. In this course students use the profile form to develop a variety of skills that may be helpful whenever undertaking an ambitious story: figuring out what the story is and why you are writing it; interviewing; observation; background reporting; structuring material; finding your voice; describing people without resorting to cliché; crafting a lead from what seems an infinite number of possibilities. Readings will be from great magazine and newspaper profile writers. (F,S) Gorney

243. Long-Form Writing. (3,4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Prerequisites: 200 or consent of instructor. This class will trace the process of writing long-form pieces: how writers choose their sources, gather information, organize their material, and decide whether or not to believe what people are saying. Students will not be assigned a test project. (F,S) Staff

251. Reporting as Literature. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion plus eight hours of field work per week. Prerequisites: 200 or consent of instructor. Study of investigative reporting, analysis of its technique with outside reporting assignments. (F,S) Staff

252. Magazine Article Writing. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion and eight hours of fieldwork per week. Prerequisites: For journalism students, 200; others may be admitted by consent of instructor. Study and analysis of the techniques of writing and editing of articles for publication. (F,S) Staff

255. Law and Ethics. (3) Three hours of lecture per week. Prerequisites: 200 or consent of instructor. The first eight weeks will concentrate on First Amendment and media law, including libel and slander, privacy, free press/fair trial conflicts, and litigation arising from controversial reporting methods. The closing weeks will focus on ethical dilemmas faced by reporters and editors. Using case studies, readings, and guest lecturers, the course examines the murky conflicts that don’t necessarily make it to court but nevertheless force difficult newsroom decision making. (F,S) Staff

260. Investigative Reporting for TV and Print. (2,3) Two hours of seminar per week. Students will be required to investigate leads that are received by the faculty and prepare broadcasts or written class projects to introduce guest speakers. They will work on research and reporting assignments related to the field. (F,S) Staff

266. Law for Legal Affairs Reporting. (3) Three hours of lecture/discussion per week. Additional outside time in the courts. Examination of the structure and philosophy of the legal system to prepare the journalist for reporting legal affairs. (F,S) Staff

275. Radio News Reporting. (4) Four hours of lecture and four hours of laboratory work per week. Study of techniques, practices, and methods of gathering and writing radio news. Students will produce weekly live radio news programs. Enrollment is limited to 15. (F,S) Drummond, Staff

282. Introduction to Television News. (4) Four hours of lecture and four hours of laboratory work per week. Experiments in the practical details of television news gathering and some fieldwork. Study of the history and institutions of broadcast journalism (nine weeks), practice, techniques of reporting news for radio. (F) Biedler, Calo, Staff

283. Reporting for Television. (5) Six hours of lecture/discussion and 24 hours of laboratory/work per week. Prerequisites: 282 and consent of instructor.
284. Documentary Production. (4) Three hours of lecture and 12 hours of laboratory/workfield per week. Prerequisites: 292, 293, and consent of instructor. Production of television documentary news programs. (F,SP) Staff

285. Advanced Television Reporting: Longform Television. (4) Three hours of lecture, and 15 hours of laboratory. Prerequisites: 281, 282, and consent of instructor. Reporting and production of television news magazine stories and programs. (F,SP) Bieder, Calo

286. History of Documentary. (3) Three hours of seminar per week. This course covers the evolution of American documentary film from 1920 to the present, with special attention to independent productions and documentaries for network television. In the works of Fred Wiseman, Henry Hampton, Lourdes Portillo, Endl Morris, Marin Riggs, Barbara Kopple, Orland Bagwell, the Maysles, and the network staff producers, we look at the practical problems of making documentaries for a mass audience. (Required for J-School students majoring in considering specializing in documentary.) (SP) Else

287. Inside Frontline. (1,2) Two hours of seminar for ten weeks. This seminar course provides students with the opportunity to meet with and discuss projects with Frontline producers and reporters. Each session will focus on a single documentary episode and take an in-depth look on the development of the story out of an idea, the journalistic approach and methods used by the team, the process of finding and creating the appropriate dramatic structure, and the public impact and critique of the program. (SP) Staff

288. Digital TV and the World. (3,4) Course may be repeated for credit. Three hours of lecture and nine hours of laboratory per week. Prerequisites: Journalism students only and consent of instructor. Students not enrolled in the TV College who wish to learn essential techniques and examine new reporting forms are invited to apply for this experimental class. Students learn the basics of TV reporting, how to cover a slice of community, produce a series, and produce thoughtful works for distribution on the Web and on the air. Students learn the rudiments of digital production, reporting, and editing. The course will emphasize production, clear expression, and original storytelling. (F,SP) Staff

290. Editing Workshop. (2,3) Course may be repeated for credit with different topic and consent of instructor. Two to three hours of seminar and individual meetings per week. Prerequisites: Journalism students only, preparedness-second-year students completing master's project. It can take a lifetime of writing to learn how to critique and revise your work. Hard as writing can be, rewriting—breaking back into your own framework, rethinking, re-imagining—and revising—can be harder yet. Sometimes only an editor can help you gain the distance needed to view your work. No matter how good a journalist you may be, an editor can help you reach another stage in your writing process. (F,SP) Staff

294. Master's Project Seminar. (1-2) One hour of seminar per week. Prerequisites: 200 and consent of instructor. Group meetings plus individual tutorials. Methods of research, organization, and preparation of professional thesis projects. Required of M.J. candidates working on thesis projects during both fall and spring semesters. (F,SP) Staff

297. Field Study in Journalism. (1-2) Course may be repeated for credit and topics vary. Special emphasis is placed on research, organization, and preparation of professional thesis projects. Required of M.J. candidates working on thesis projects during both fall and spring semesters. (F,SP) Staff

298. Group Study—Special Topics. (2-4) Course may be repeated for credit as topic varies. Three hours of group meeting per week. Specialized seminar topics in reporting and writing. (F,SP) Staff

299. Individual Study. (1-3) Course may be repeated for credit. Individual study. Supervised individual study and research. (F,SP) Staff

601. Individual Study for Master's Students. (1-6) Course may be repeated for credit with consent of graduate adviser. Individual study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Course is restricted to journalism students. Individual preparation or study in consultation with faculty adviser. Study ultimately leads to the completion of the master's project/examination. Units may not be used to meet either unit or residence requirements for a master's degree. (F,SP) Staff

Landscape Architecture and Environmental Planning (College of Environmental Design)

Department Office: 202 Wurster Hall, (510) 642-4022 laep.ced.berkeley.edu
Chair: G. Mathias Kondolf, Ph.D.
Professor
Peter C. Bosselmann, M.Arch. University of California, Los Angeles. Urban design
Walter J. Hood Jr., M.Arch., M.L.A., University of California, Berkeley. Community design, landscape design, site planning
Charles H. (Chip) Sullivan, M.L.A. University of California, Berkeley. Community design, landscape design, site planning
Landscape architecture (M.L.A.), and Master of Landscape Architecture (M.L.A.)

Graduate Program

The Master of Landscape Architecture Degree. The Master of Landscape Architecture (M.L.A.) degree is a professional degree accredited by the American Society of Landscape Architects. The program offers advanced work in landscape architecture from the scale of detailed form to that of the regional landscape. A core of courses in the department is required of all students, emphasizing the relationship between the design and the environmental planning aspects of the field. This core group forms the foundation for extended coursework in landscape design, urban and community design, and environmental planning.

The Professions

The profession of landscape architecture plays an important role in solving environmental problems through design and planning. Professional practice includes design of public spaces for recreation, especially parks, and trails; design of street systems, and streets; and planning for conservation of open space and natural amenities; land management; and development; and assessment of the impact of projects and proposals on environmental quality and design such projects to be environmentally compatible.

Landscape design typically involves project programming; site planning of buildings and building complexes; and analysis, planning, and detailing of design of public and private outdoor spaces, parks and landscapes. It requires an understanding of visual and social factors, plant materials, construction technology, cost, and ecology.

Environmental planning is concerned with the larger context of natural and urban environments including the study of ecology, conservation planning, environmental law, resource development, computer applications, recreation planning, and urban open space and transportation systems. The intent of all the emphases is the creation of delightful outdoor landscapes that are ecologically sound and socially informed.

Undergraduate Program

The four-year curriculum leading to the A.B. degree with a major in landscape architecture provides a general education in environmental design and serves as preparation for subsequent graduate education or entry-level work in the field. The emphasis is on design. UC students who earn the A.B. degree will become eligible to take the state examination after fulfilling a two-year apprenticeship under a licensed landscape architect.

Required core courses represent a minimum basic coverage in theory, design, and technology, but the program provides an opportunity to study more intensely all aspects of landscape architecture, including landscape analysis and planning, urban design, recreation, site design and development, graphics, construction, and planting design.

For more complete information, visit laep.ced.berkeley.edu/programs/undergraduate/abdegree.

Adjunct Professors
John L. Krilin, M.Arch. Harvard University. Urban design
David Meyer, B.S. Landscape Architecture
the design of sites and the design of buildings. This program is for exceptionally qualified students who have an undergraduate degree in architecture or landscape architecture and who satisfy the admission requirements of the one- or two-year M.Arch. program and/or the two-year M.L.A. program. Applicants to either of the above concurrent degrees must apply to the Department of Landscape Architecture and Environmental Planning by December 15. Acceptance into the concurrent degree program is limited to outstanding applicants. More information may be obtained from the Graduate office in 202 Wurster Hall or from our website.

Master of Urban Design. The Master of Urban Design is for exceptionally well-qualified students who have a bachelor’s degree in architecture, urban design, and a minimum of two years of professional experience after completion of the undergraduate degree. See the Urban Design section of this catalog for further information.

The Ph.D. Degree in Environmental Planning. The Ph.D. program in environmental planning is offered for students who wish to pursue advanced scholarly and research work. The program emphasizes the development of the criteria to aid planners underlie the fabric of environmental planning or urban design, and the processes of planning and design as they relate to the solution of problems in the natural and urban environment. The Ph.D. degree in environmental planning is appropriate for those seeking careers in research and teaching in environmental planning or urban design or in specialized roles in government or professional consultation.

There are no courses specifically required for the Ph.D. degree. In consultation with their faculty advisers, students formulate a coursework plan best suited to their individual specializations within the field of environmental planning.

Ph.D. requirements are as follows: 32 units of upper division and graduate coursework, two-year academic residency, reading knowledge of a departmentally approved foreign language, successful completion of a qualifying examination, and a dissertation. Progress toward the degree is evaluated annually by the Ph.D. committee. Admission is granted to a small number of individuals each year. Most applicants will have completed a master’s degree before entering. Students with only a bachelor’s degree should apply to the M.L.A. program or otherwise consult an appropriate master’s degree before applying.

For information about these programs, contact the Graduate office, Department of Landscape Architecture and Environmental Planning, 202 Wurster Hall; or laep.ced.berkeley.edu/programs.

Lower Division Courses

C12. Environmental Science for Sustainable Development. (4) Three hours of lecture and one hour of discussion per week. Three units may be graded on a letter-grade basis. Energy and water audits of UC Berkeley; opportunities to increase sustainability of processes/practices. Discussion/lab section involves data collection/analysis (e.g., atmospheric particulates) and integrative sustainability assessment project. Also listed as Environmental Sciences C12. (F) (K) Kondolf, Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week may be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Open to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers. Freshman seminars in science and arts are offered in all campus departments; topics vary from department to department and from semester to semester.

84. Sophomore Seminar. (1,2) Course may be repeated. One hour of seminar per week for five weeks. One and one-half hours of seminar per week for 10 weeks. Three hours of seminar per week for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and from semester to semester. Enrollment limited to 15 sophomores. (F,SP)

98. Directed Group Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Prior approval from department and an introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Department chair must approve written proposal. This course allows upper-division students to pursue topics of interest to their courses. Topics are chosen by department that are not covered in depth by other courses. Topics to be identified by students. Open to students in good standing who, in consultation with a faculty member, desire to pursue a topic not currently being offered in a formal course. Intended for exceptional students. Topics vary from semester to semester. (F,SP)

Upper Division Courses

101. Fundamentals of Landscape Design. (5) Two hours of lecture and six hours of studio per week. Prerequisites: Environmental Design 1A-1B or consent of instructor. This studio introduces students to the programmatic, artistic, and technical aspects of land form and topographic adjustments to accommodate humans. Topics include pedestrian and vehicular circulation, conservation and addition of plant materials, movement of water, recreation use, and creation of views. Sculptural land forms will be emphasized through the use of landscape sections, and contour models. (F) Stilgenbauer, Staff

102. Case Studies in Landscape Design. (5) Two hours of lecture and six hours of studio per week. Prerequisites: 101, Architectural 100A, or consent of instructor. This course introduces the visual and physical characteristics of landscape construction materials, including, but not limited to, stone, brick, concrete, metal, asphalt, and wood. Additionally, lectures cover the production and availability of these materials, any existing evaluations on their sustainability, and their potential interactions with their immediate environment. Students also learn to utilize standard sources of information on building materials and the terminology typically utilized when choosing and specifying products for construction materials. Course also covers the familiar with dimensional standards for landscape structures, including pavements, stairs, furnishings, retaining walls, freestanding walls, fountains, decks, and small overhead structures. (SP) Jewell

120. Topographic Form and Design Technology. (3) Two hours of lecture and two hours of studio per week. Prerequisites: 100A or by consent of instructor. Technical, graphic and computational exercises, and studio problems in topographic site design and the shaping of the site for surface drainage. (SP) Jewell

121. Design in Detail: Introduction to Landscape Materials and Construction. (4) Three hours of lecture and one hour of lab per week. Prerequisites: 101, Architectural 100A, or consent of instructor. This course introduces the visual and physical characteristics of landscape construction materials, including, but not limited to, stone, brick, concrete, metal, asphalt, and wood. Additionally, lectures cover the production and availability of these materials, any existing evaluations on their sustainability, and their potential interactions with their immediate environment. Students also learn to utilize standard sources of information on building materials and the terminology typically utilized when choosing and specifying products for construction materials. Course also covers the familiar with dimensional standards for landscape structures, including pavements, stairs, furnishings, retaining walls, freestanding walls, fountains, decks, and small overhead structures. (SP) Jewell

122. Environmental Science for Sustainable Development. (4) Three hours of lecture and two hours of discussion/labatory per week. Topics include the scientific basis of sustainability, explored through study of energy, water, food, natural resources, and built environment, Physical/eco logical processes and systems, and human impacts from the global scale to local energy/resource use; Energy and water audits of UC Berkeley; opportunities to increase sustainability of processes/practices. Discussion/lab section involves data collection/analysis (e.g., atmospheric particulates) and integrative sustainability assessment project. Also listed as Environmental Sciences C12. (F) (K) Kondolf, Staff

103. Energy, Fantasy, and Form. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 101, 102, Environmental Design 1A-1B, Architectural 100A or 100B for architecture students) or by consent of instructor. This is a graduate studio with a central focus on climate modification for energy conservation. Students will be presented conceptions in order to develop new garden forms for passive green design. We will also explore how past cultures integrated metaphysics into their gardens as an adjunct to microclimate. Such designs are contemporary landscape should be a balanced interweaving of proportion, function, comfort, energy conservation, and enlightenment. Additionally, we will study the choreography of space and investigate how to animate the landscape through the creation of text and film. Many new and exciting opportunities lie ahead for the creation of garden forms that not only conserve energy but are also works of art and places of spiritual renewal. (F) Sullivan

110. Ecological Analysis. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 101, Architectural 100A, or consent of instructor. This is an introduction to how to create and manage landscapes that are sustainable with respect to their environment. We will explore the relationships of ecological factors, ecosystem functions, and ecosystem dynamics, as related to decision making for landscape planning and design. (F) McBride

111. Plants in Design. (3) Three hours of lecture and one hour of lab per week. Prerequisites: Environmental Design 11A-11B or consent of instructor. Through lecture, research, and studio assignments, this course introduces the use of plants as design elements in the landscape, from the urban scale to the site-specific scale, focusing on the public open space. By analyzing historic, contemporary, and Bay Area examples, the course examines the spatial, visual, and sensory qualities of vegetation, as well as the interplay with ecological functions and engineering uses of plants. (F) Stilgenbauer

202. Landscape Plants: Identification and Use. (4) Two hours of lecture and six hours of fieldwork per week. This course is an introduction to the identification and uses of plants, in the landscape. Through lectures, assignments, and fieldwork, the course provides class participants with an appreciation of the breadth of plant material available. Students will be introduced to a variety of built projects and plants commonly used in Bay Area landscapes. (SP) Stilgenbauer

8 prefix=language course for business majors
C prefix=core course
H prefix=honors course
R prefix=course satisfies R&C requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course
*Professor of the Department of Architecture
†Recipient of Distinguished Teaching Award
drawings and live models. The realms of moving

Through the integration of drawing with intuition and

municating landscape design. In addition to field

presentation techniques will be investigated for com-

method to design innovative landscapes. A variety of

students progressively gain creativity, skill, and con-

The lab/studio seeks innovative application of tech-

ology to medium- to large-scale landscape design

diseases. The focus of the lab/studio varies from

semester to semester, but typical topics include garden

design, park design, neighborhood design, open space
design, and others. (F) Radke

32A. Computer Applications for Environmental Design. (2) Two hours of lecture and two hours of labor-

atory per week. This course consists of both a lec-
ture and a lab/studio laboratory session each week.
The lecture is structured as a seminar in which the

structor and students discuss problems and CAD

solutions in landscape design. The laboratory pro-

ides a practical introduction to some tools for spa-
tial data manipulation in CAD. (F) Radke

32B. Field Study in Landscape Architecture. (2) Two hours of lecture and two hours of labor-

atory per week. This course is designed to prepare

students for the reality of field study in landscape

architecture. (F,SP)

C108A. The American Landscape: Multicultural Difference and Diversity. (3) Three hours of lecture and

one hour of discussion per week. This course will

compare and contrast the nature of African Ameri-
can, American Indian, and European American rela-
tionships with the American landscape. Traditional

patterns of land use within each subculture will be

explored, and juxtaposed against prevailing theory

and historical context. The class will include lectures by the

staff, faculty members offering the course, guest lectures,

and field trips. (F,SP) Staff

197. Field Study in Landscape Architecture. (2-3)

Hours to be arranged. Must be taken on a passed/not

passed basis. Prerequisites: Upper division standing

and consent of instructor and a satisfactory score on the en-

vironmental information sheet for limitations. Supervised

experience relative to specific aspects of landscape

architecture. Regular individual meetings with faculty

advisor and outside sponsor. Report of satisfactory

work. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) May be taken on a passed/not passed basis.

Prerequisites: Consent of instructor. Enrollment restrictions apply. (F,SP) Staff

Graduate Courses

201. Ecological Factors in Urban Landscape Design. (5) Two hours of lecture and six hours of labor-

atory per week. Prerequisites: 110, 134A-134B, or

consent of instructor. Through lectures, studio pro-

jects, research projects, and discussion, this course

will explore the challenge and potential incorporating

ecological factors in urban landscapes. The course

will address the important elements of human-

environmental relationships in urban areas and the

ways in which these elements interact with the

built environment. The course provides the student

with the knowledge and skills needed to analyze

and design urban landscapes that are sustainable and

environmental friendly. (F) Kullman, Staff

202. Design of Landscape Sites. (5) Two hours of

lecture and six hours of studio per week. Prer-

erequisites: 201 or consent of instructor. This course

will provide an opportunity to apply the principles

of landscape architecture to the design of land-

scape environments in both urban and rural settings.

The course will focus on the design of private

site, public park, and community landscape projects.

Prerequisites: Consent of instructor and a satisfactory

score on the environmental information sheet for

limitations. Supervised experience relative to specific

aspects of landscape architecture. Regular individual

meetings with faculty advisor and outside sponsor.

Report of satisfactory work. (F) Kullman, Staff

203. Landscape Project Design. (5) Three hours of

lecture and six hours of studio per week. Prer-

quisites: 201 or consent of instructor. A site design

project stressing the shaping and coordination of ideas

from initial concept to complete design of open space

in various contexts. Typical projects will be of an inter-

mediate scale and might include a park, plaza,
museum sculpture garden, parkway, office park,

or housing project. Modules on social factors and

planting design are included. (SP) Hood, Kullman

211B. The American Designed Landscape Since 1850. (3) Three hours of lecture per week. This course

surveys the history of American landscape architecture

since 1850 in four realms: (1) urban open spaces—

that is squares, plazas, parks, and recreation sys-
tems; (2) urban and suburban design; (3) regional

and environmental planning; and (4) gardens. The course will review the cultural and social contexts

which have shaped and informed landscape archi-
tecture in the United States since the advent of the

public-park movement, as well as the aesthetic pre-
crepts, environmental concerns, horticultural prac-
tices, and technological innovations of American landscapes. Students will complete a midterm, final, and a research assignment. Also listed as American Studies C171, (SP) Mazingo

C188. Geographic Information Systems. (4) Three hours of lecture and two hours of laboratory per week.

Prerequisites: Some computer experience. Formerly

194. This course introduces the student to the rapidly expanding field of geographic information sys-
tems (GIS). It addresses both theory and application
and provides the student with a dynamic analytical
framework within which temporal and spatial data
and information is gathered, integrated, interpreted, and

manipulated. It emphasizes a conceptual apprecia-
tion of GIS and offers an opportunity to apply some

of those concepts to contemporary geographical and

planning issues. Also listed as Geography C188. (F) Radke
C203. Shaping the Public Realm. (5) Three hours of lecture and six hours of studio per week. Prerequisites: Previous design studio or consent of instructor. Formalizing the public realm-urban design studio focuses on the public realm of cities and explores opportunities for creating more humane and delightful public places. Problems will be at multiple scales in both existing urban and new growth settings. New skills in analyzing, designing, and communicating urban design problems will be developed. Studio work will be supplemented with lectures, discussions, and field trips. Visiting professionals will present case studies and will serve on reviews. Also listed as City and Regional Planning C243. (F Southworth

204. Advanced Project Design. (5) Three hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Special topics in urban design. Lecturing, designing, and criticism of student work. The focus of the studio varies from semester to semester. Possible topics include community design, educational environments, landscape as art, park design, or energy conservation design. For current offerings, see the department announcement. (F. SP Staff

205. Environmental Planning Studio. (5) Three hours of lecture and six hours of studio per week. Prerequisites: 201 or consent of instructor. Application of environmental planning principles to a complex problem of land use and environmental design. Includes field studies of environments, landscape as art, park design, or energy conservation design. For current offerings, see the department announcement. (F. SP Staff

206. Final Project Preparation Studio: Thesis and Reports. (5) Three hours of lecture and six hours of studio per week. Prerequisites: 252 and graduate standing. This is a spring studio for students to work on final project design and professional reports. The studio, including lectures by the instructor, is meant to train and assist students in thesis or professional project research and help them in finalizing their thesis or professional project. The course includes weekly exercises ranging from writing articles documenting, illustrating, and critiquing landscapes to finally producing a thesis or professional report. (F. SP Mozingo

212. Landscape Ecology. (3) Two hours of lecture and two hours of lab per week. Prerequisites: Graduate standing, or consent of instructor. Concepts of landscape ecology and their application to environmental planning. Topics include landscape structure, biodiversity, species flow, redistribution of nutrients and toxic elements, energy flow, landscape change, and landscape management. (F.SP McBride

221. Quantitative Methods in Environmental Planning. (3) One and one-half hours of lecture and three hours of lab per week. Prerequisites: Two-week overview of the application of quantitative methods to environmental assessment, analysis, and evaluation in environmental planning. Topics include geographical information systems, regression analysis, time series analysis, and multivariate analysis. This course emphasizes computer applications and data analysis. (SP) Radke

222. Hydrology for Planners. (4) Three hours of lecture and two hours of laboratory per week, plus three days of weekend field trips. This course presents an overview of the hydrologic, hydraulic, and morphologic processes, to provide the planner and ecologist with sufficient knowledge and skill to work with technical specialists in the field of hydrology. In addition, relevant regulations and data sources are reviewed. (SP) McBride

223. Introduction to California Landscapes. (1) One hour of lecture/discussion per week plus two field trips (total of four days). Must be taken on a satisfactory/unsatisfactory basis. Introduction to the ecology, visual characteristics, land use, and design history of major landscape regions in California. (SP McBride

225. Urban Forest Planning and Management. (3) Three hours of lecture per week plus two one-day field trips. Introduction to the field of urban forestry, its history, and its role in contemporary towns and cities. Emphasis on planning and management of the urban forest, restoration of old parks, street trees, and community participation. Offered alternate years. (SP McBride

226. Landscape Design Construction. (2) Two hours of lecture and three hours of studio per week. Prerequisites: 121 (may be taken concurrently). The course investigates the process of developing schematic landscape designs. The final design will be constructed specifically for a project site. The class will learn about design techniques, landscape aesthetics, and design details, the efficient use of materials, and the ability to evaluate how material selection and detailing can impact the environment. Field trips to construction sites, manufacturers' facilities, and built landscapes will be included. (SP Jewell

227. Restoration of Rivers and Streams. (3) Three hours of seminar per week. Prerequisites: 220, 222, 201 (or comparable coursework), Environmental Science, Policy, and Management 115A, or Geology 117 with consent of instructor. This course will examine the underlying goals and assumptions of river and stream restoration projects, reviews techniques employed in these efforts, and emphasizes strategies for evaluation of project success. The course focuses on geomorphology and hydrologic analyses relevant to restoration and enhancement of aquatic and riparian habitats in freshwater systems. Format: lectures by instructor, guest lecturers, field projects, and site visits. Field projects and field trips. Course requirement: independent term project involving original research. (F) Kondot

228. Research in Environmental River Planning, Management, and Restoration. (1) Course may be repeated for up to six semester hours. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to all graduate students interested in the field. This course consists of: (1) presentations by students of proposals, progress reports, and final results of the independent student projects; and (2) reviews of recently published research papers in the field. Students review recent issues of specific journals for all papers relevant to environmental river planning and management. Each student will report on the papers to the seminar, broadly reviewing all the relevant papers and going into depth on one. Emphasis is on research methods and new findings. Oral presentation skills are also critiqued. Requirement: one or two oral presentations, accompanied by a two-page handout. (F.SP) Kondot

C229. Mediterranean-Climate Landscapes. (1-3) One to three hours of lecture/seminar/studio per week. Prerequisites: Geology 117, or admission to Landscape Architecture 237. Concepts of landscape structure, biodiversity, species flow, water systems. Format: lectures by instructor, guest lecturers, field projects, and site visits. Course requirement: independent term project involving original research. (F) McBride

C231. Environmental Planning and Regulation. (3) Three hours of lecture per week. This course will examine emerging trends in environmental planning and policy and the basic regulatory framework for environmental planning in the United States. We will also relate the institutional and policy framework of California and the United States to other nations and emerging international institutions. The emphasis of this course is on the regulatory “residuals” as they affect media: air, water, and land. Also listed as City and Regional Planning C251. (F) Coturnas

232. The Landscape as a Sacred Place. (3) Three hours of lecture per week and two field trips (total of three days). Visual and cultural analysis of landscapes, inventory of natural values, and problems related to sustainable development, with special emphasis on highly valued places. Offered every third year. (SP) Staff

235. Environmental Simulation and Public Communication. (2-4) Two hours of lecture and six hours of laboratory per week. Introduction to the theory of experimental simulation; criteria for a good presentation; case studies in the use of models and media in citizen participation and environmental design. (SP) Bosselman

C237. The Process of Environmental Planning. (3) Students will receive no credit for C237 after taking Landscape Architecture 237. Three hours of lecture and six hours of laboratory per week. Prerequisites: Landscape Architecture C251. A review of the techniques used in environmental planning, and evaluation of alternative means of implementation in varying environmental and political circumstances. The class will examine emerging trends in environmental planning programs and plans. Lectures and discussion will address current planning problems, such as the limitation of available data, conflicting political constraints on plans, conflicts among specialists. Also listed as City and Regional Planning C257.

C241. Research Methods in Environmental Design. (4) Three hours of lecture/semia seminar and two hours of laboratory per week. Formerly Interdepartmental Studies 241. The components, structure, and meaning of the urban environment. Environmental problems, attitudes, and criteria, Environmental survey, analysis, and interview techniques. Methods of addressing environmental quality, Environmental simulation. Also listed as City and Regional Planning C241. (F) Bosselman

C242. Citizen Involvement in the City Planning Process. (3) Students will receive no credit for C242 after taking City and Regional Planning 208. Formerly Interdepartmental Studies 208, Interdepartmental Studies 206 (fall 1991). Three hours of lecture/semester per week. Formerly Interdepartmental Studies 223. An examination of the role of the citizens in the development of environmental planning processes. Models for citizen involvement in advising to community control. Examination of the effectiveness of different organizational models in different situations. Also listed as City and Regional Planning C242.

C250. Theories of Urban Form and Design. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Theories and patterns of urban form throughout history are studied with emphasis on the role of planning and design in shaping cities and the relationship between urban form and social, economic, and geographic factors. Using a case study approach, cities are evaluated in terms of various theories and performance dimensions. Also listed as City and Regional Planning C257. (F Southworth

251. Theories of Landscape Architecture and Environmental Planning. (2) Two hours of seminar per week. The focus will be on debate and discussion of central ideas in landscape architecture and environment planning, drawn from literature over many decades of thought. This is not a history course, but it will include some literature that goes back to the early years of the field. This course covers the term of examination in the field, including both envi ronmental planning and landscape design as well as other sub disciplines. Each week students will lead a debate on a different theoretical issue. (SP Mozingo/ Southworth

252A. Thesis and Professional Project Proposal Seminar. (2) Two hours of session per week. Prerequisites: Proposal must be submitted prior semester and approved by LAEP curriculum committee. Students learn research methods including social factual/archival, qualitative, master planning, theoretical, and scientific fieldwork. Students develop a conceptual framework, survey instrument, literature review, and detailed work plan. A full committee funding proposal due on the last day of class. (SP Staff

252B. Thesis and Professional Project Proposal Seminar. (2) Two hours of session per week. Prerequisites: 252A. Students learn research methods including social factual/archival, qualitative, master planning, theoretical, and scientific fieldwork. Students develop a conceptual framework, survey instrument, literature review, and detailed work plan. A full committee and funding proposal due on the last day of class. (F Staff
253. **Landscape Architecture and Environmental Planning Colloquium.** (1) Course may be repeated for credit. One and one-half hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Invited lectures on current research, planning practice, and design projects. Out of approximately 14 presentations per term, typically two or three would be by departmental and/or two by grad- ing students, the remainder by outside speakers. (F.S.P) Staff

254. **Topics in Landscape Architecture and Environmental Planning.** (1-5) Course may be repeated for credit as topic varies. One to five hours of seminar per week. Research seminar on selected topics in landscape architecture. Semin- ars will focus on the interaction of landscapes and human societies as well as social science methods appropriate to landscape analysis. Seminars will include readings, guest lectures and presentations, and discussions. Readings and requirements vary year to year based on the topic and instructor. (F.S.P) Staff

255. **Doctoral Seminar in Environmental Planning.** (1) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Doctoral student or consent of instructor. Designed to be a forum for presentation of doctoral student research, discussions with faculty researchers and environmental planning practitioners, and examination of topical issues in landscape architecture and environmental planning. Topic will be announced at the beginning of each semester. (F.S.P) Staff

256. **Special Topics in Social Factors in Landscape Architecture.** (1-3) Course may be repeated once for credit if the topic varies. One to three hours of seminar per week. Research seminar on selected topics in social factors in landscape architecture. Seminars will focus on the interaction of landscapes and social issues as well as social science methods appropriate to landscape analysis. Seminars will include readings, guest lectures, and discussions. Readings and requirements vary from year to year based on the topic and instructor. (F.S.P) Staff

257. **Special Topics in Design.** (1-3) Course may be repeated for credit. One to three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Research seminar on selected topics in landscape design. Seminars will focus on the theoretical foundations and practical applications of design and planning methods as well as emerging issues in the discipline. Seminars will include readings by the faculty member offering the course, guest lectures, and discussions. Readings and requirements vary from year to year based on the topic and instructor. (F.S.P) Staff

258. **California Water: An Interdisciplinary Seminar.** (1) Course may be repeated for credit. Two hours of seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. This seminar studies the California water issues from an interdisciplinary perspective, building upon the established California Colloquium on Water, to increase understanding and appreciation of water resources and contribute to informed decision making about water in California. Each semester four distinguished scholars in the fields of humanities, natural sciences, engineering, social sciences, law, and environmental design present lectures to students, faculty, and the general public. Students in the seminar attend the colloquium lectures, complete background readings, and meet for two hours on alternate weeks in the seminar session to discuss issues raised by the colloquium presentations and related readings. Course requirements: attendance at colloquia, attendance and participation in seminars, completion of course readings, brief written critiques of readings, and a short presentation of liter- ature relevant to colloquium topics. (F.S.P) Kondolf

259. **Supervised Research in Landscape Architecture and Environmental Planning.** (2) Any combination of 295 or 297 may be taken for a total of six units maximum. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a research assistant. Supervised expe- rience on a research project in landscape architecture and/or environmental planning. Regular meet- ings with faculty sponsor required. See departmental information sheet for other limitations. (F.S.P) Staff

260. **Directed Dissertation Research.** (1-12) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Advancement to Ph.D. candidacy. Open to qualified students who have been advanced to candidacy for the Ph.D. degree and are directly engaged upon the doctoral dissertation. (F.S.P) Staff

261. **Supervised Field Study.** (2-3) Any combina- tion of 295 or 297 may be taken for a total of six units maximum toward the M.L.A. degree. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor and sponsor. Supervised expe- rience relative to specific aspects of practice in land- scape architecture and/or environmental planning. Regular meetings with faculty and outside sponsor as well as final report required. See departmental information sheet for other limitations. (F.S.P) Staff

262. **Group Study.** (1-4) Course may be repeated for credit. Hours to be arranged. Special group studies. Topics to be announced at the beginning of each semester. (F.S.P) Staff

263. **Individual Research.** (1-6) Course may be repeated for credit. Hours to be arranged. Prerequi- sites: Graduate standing and consent of instructor. Research work conducted preparatory to completion of the third year or beyond toward other approved research. A maximum of 6 units will be counted toward the M.L.A degree. The 6 units allow for 4 units maximum for thesis or professional project research, and 2 units maximum for other research. See departmental information sheet for other limitations. (F.S.P) Staff

264. **Individual Study for Master’s Students.** (1-8) Course does not satisfy unit or residence require- ments for master’s degree. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Last semester of residence in M.L.A. program. Individual study for final degree require- ments in consultation with advisor. (F.S.P) Staff

265. **Individual Study for Doctoral Students.** (1-6) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for the doctoral degree, for study in consultation with the major field adviser, intended to provide an opportunity for qualified students to pre- pare themselves for the various examinations required of candidates for the Ph.D. (F.S.P) Staff

Professional Courses

300. **Supervised Teaching in Landscape Archi- tecture and Environmental Planning.** (2) Course may be repeated for credit. Hours to be arranged. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and appointment as a teaching assistant. Supervised teaching experience in undergraduate courses. Regular meetings with fac- ulty sponsor. See departmental information sheet for other limitations. (F.S.P) Staff

301. **Methods of Teaching in Landscape Archi- tecture and Environmental Planning.** (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student standing. This course presents general pedagogical principles and methods adapted to teach- ing in the fields of landscape architecture, environ- mental planning, and related environmental sciences. The format varies from week to week, but involves pre- sentations by faculty and experienced graduate student instructors (GSIs), guided discussions, sharing of teaching experiences for current GSIs, discussion of readings on effective teaching, viewing of videos, and presentation by GSIs of sections for upcoming weeks. Required of all graduate students to be eligible for appointment as GSIs; may be taken concurrently with first GSI position for entering students. Topics include learning objectives, lesson plans, active learn- ing, group learning, classroom diversity, assessing student learning, giving constructive feedback, teach- ing in the studio environment, engaging students through field exercises, grading, and composing effec- tive tests. (F.S.P) Staff

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### Latin American Studies

**Group Major Office:** International and Area Studies, 101 Stephens Hall, hastp@berkeley.edu, (510) 642-4466

**Chair:**

**Faculty Advisers**

- Miguel Aller (Environmental Science, Policy, and Management)
- Starling Brandes (Anthropology)
- Claudia Carr (Environmental Science, Policy, and Management)
- Lydia Chavez (Journalism)
- Margaret Chorney (History)
- Ruth Benss Collier (Political Science)
- Alain de Janvry (Agricultural and Resource Economics)
- Laura Empey (Sociology)
- Peter Evans (Sociology)
- Sylvia Góndelman (Public Health)
- William Hanks (Anthropology)
- Mark Heyer (History)
- Michael Johns (Geography)
- Rosemary Joyce (Anthropology)
- Beatriz Marz (Chicano Studies/Geography)
- Francesc Masiello (Spanish and Portuguese/Comparative Literature)
- Clara Nicholls (International and Area Studies)
- Julio Ramos (Spanish and Portuguese)
- Alex Sarazaga (Ethnic Studies)
- Nancy Becker-Hughes (Sociology)
- Harley Shaken (Education)
- Cándido Sánchez (Spanish and Portuguese)
- Estelle Tarica (Spanish and Portuguese)

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### Program

The Program in Latin American Studies is designed to provide a balanced multidisciplinary curriculum in the history, culture, and society of Latin America for students wishing a broader perspective of the area than is usually available through a departmental major. The program may be of particular interest to students planning to enter business, government, or international agency service; preparing to teach social science or language; or preparing for graduate and professional schools.

There is a wide range of courses from numerous departments to suit the interests of LAS majors. Spanish and Portuguese are required for the major. Students must gain an intermediate level of proficiency in one and an elementary level of the other. In addition, students pursue a multidisciplinary course of study that includes the history and literature of the region. To assist in organizing a plan of study, students are aided by participating faculty members from several departments and programs, the faculty chair of the group major, major advisers in the International and Area Studies Program Office, and teaching associates working in the program.

### The Program Major

Declaring a major in Latin American studies follows guidelines established by the College of Letters and Science. Applications are accepted throughout the fall and spring semesters from the beginning of the fourth week of instruction until one week before the last day of instruction (not the last day of finals). Applications are not accepted during the summer. Students who have completed the required prerequisites coursework may apply to LAS in their freshman or sophomore year. All students must apply no later than the first semester of their junior year. Students wishing to declare Latin Ameri- can studies: 

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### Notes

- The Program
- Latin American Studies
- (College of Letters and Science)
- Group Major Office: International and Area Studies, 101 Stephens Hall, hastp@berkeley.edu, (510) 642-4466
- Chair:
- Faculty Advisers
  - Miguel Aller (Environmental Science, Policy, and Management)
  - Starling Brandes (Anthropology)
  - Claudia Carr (Environmental Science, Policy, and Management)
  - Lydia Chavez (Journalism)
  - Margaret Chorney (History)
  - Ruth Benss Collier (Political Science)
  - Alain de Janvry (Agricultural and Resource Economics)
  - Laura Empey (Sociology)
  - Peter Evans (Sociology)
  - Sylvia Góndelman (Public Health)
  - William Hanks (Anthropology)
  - Mark Heyer (History)
  - Michael Johns (Geography)
  - Rosemary Joyce (Anthropology)
  - Beatriz Marz (Chicano Studies/Geography)
  - Francesc Masiello (Spanish and Portuguese/Comparative Literature)
  - Clara Nicholls (International and Area Studies)
  - Julio Ramos (Spanish and Portuguese)
  - Alex Sarazaga (Ethnic Studies)
  - Nancy Becker-Hughes (Sociology)
  - Harley Shaken (Education)
  - Cándido Sánchez (Spanish and Portuguese)
  - Estelle Tarica (Spanish and Portuguese)
(1) must have completed LAS 10, which is offered fall semester only, with a grade of C or better (students can repeat LAS 10 only once in order to obtain a grade of C or better); (2) have a major and cumulative GPA of 2.0 or higher; (3) must have attended a major declaration workshop; (4) must not be in their final semester of undergraduate work; and (5) are encouraged, but not required, to have completed at least four semesters of college-level Spanish or Portuguese, or the equivalent.

Students are reminded that: (1) no coursework for the major can be taken on a pass/not passed basis (except for upper division courses); (2) two upper division courses may be used to satisfy requirements in both a major and a minor; (3) no fewer than 30 units in upper division courses are required, including a methodology course (and at least one additional upper division course). The major is completed through coursework equivalent to two college-level semesters.

Applications are available in the IASTP Office, 101 Stephens Hall. They must be signed by the LAS faculty chair and returned to the IASTP Office.

Minor. Latin American studies does not offer a minor program. However, other minor programs taken in conjunction with Latin American studies are eligible for a minor with four courses required, only if more than one upper division course can be used to satisfy requirements in both a major and a minor.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science. No more than two upper division courses may be used to satisfy requirements in both majors.

Courses Outside L&S. No more than three courses outside the College of Letters and Science may be used to fulfill major group requirements.

Study Abroad. The use of coursework taken at institutions outside the United States to fulfill major requirements must be approved by the faculty chair and is restricted to the equivalent of three semester-length upper division courses. However, courses taken to fulfill the foreign language requirement and lower division prerequisite for each major group are not included in this restriction.

Transfer Courses. A maximum of three upper-division courses taken at other institutions (including those of the UC Education Abroad Program) may be transferred into the major. These courses will be accepted only as three of the nine required upper division courses (regardless of unit value) and must be validated by the Office of Undergraduate Admissions and approved by the chair of the Latin American studies department. These courses may be used to fulfill foreign language and lower division requirement are not included in this restriction, but must be approved by an adviser.

Honors Program. To graduate with honors from the group major in LAS, students must enroll in the two-semester honors seminar, IAS H102 (fall only) and LAS H195 (spring only), and must obtain GPA of 3.6 in the major and 3.5 in overall University coursework. The honors seminar (LAS H195) is taken in addition to a student's regular coursework for fulfilling requirements for the major and culminates in the writing of a senior thesis. The thesis—a research paper generally 75 pages or longer—must be approved by the LAS H195 instructor and at least one other faculty member who is selected by the student in consultation with the thesis instructor. Eligibility for participating in the Honors Program is determined by the IAS office.

Note: There is no guarantee that students accepted into the Honors Program will graduate with honors. Honors recommendations are made after graduation and are based on a number of factors including, but not limited to, major GPA, grades received in IAS H102 and LAS H195, and faculty adviser recommendations.

Course Plan

The considerable flexibility within the Latin American studies major allows students to construct a program appropriate to their specific intellectual and geographic interests. The overarching structure of the major, however, presumes that each student has a three-tiered program:

(1) Two lower division courses are completed in which the student is introduced to Latin American Studies, is critical.

(2) Language proficiency in both Spanish and Portuguese is required. Students choose one of these languages as their primary language and complete coursework equivalent to four college-level semester courses in the major's language requirement. This coursework is completed through coursework equivalent to two college-level semesters.

(3) No fewer than 30 units in upper division courses are required, including a methodology course (and at least one additional upper division course). The Latin American history courses, and five elective courses through which the student builds a working knowledge of the culture, history, literature, politics, and economy of Latin America. These courses are chosen in consultation with a faculty adviser.

In addition, students may enroll in the Honors Program, which consists of a methods course (IAS H102) and an honors thesis seminar (LAS H195).

Lower Division Requirements. There are two requirements: LAS 10 (pre-colonial Latin American literature) equivalent to four college-level semesters of instruction and an elementary level of competence in a secondary language equivalent to two college-level semester coursework. The secondary language coursework may consist of any combination of high school, college, summer program, or college-level study abroad program. This requirement may be satisfied by a proficiency examination or by the completion of appropriate coursework with a grade of C- or better. Please consult with a faculty adviser or with an IAS adviser for current acceptable equivalency exams or coursework.

Primary language requirement: Completion of one semester of the following: Spanish 101A, 101B, or Portuguese 101A, 101B, 102, and 103.

Secondary language requirement: If the primary language is Spanish, the student must take at least one methodology course appropriate to the major's primary language, Portuguese. Two upper division courses must be taught in Portuguese, and five additional Portuguese literature classes must be taught in Portuguese. Both courses must be taught in Portuguese. 

Latin American literature and culture (two courses). For students whose primary language is Spanish, one course must focus on the colonial period (pre-1800) and one course on 19th-20th century literature. For students whose primary language is Portuguese, either Portuguese or 102 must be taken plus one additional Portuguese literature class, as Portuguese 107, 135, or the equivalent. Both classes must be taught in Portuguese. See the chair or a group adviser for approval of class choices. Note: Spanish 135 and Portuguese 135 are variable topics classes. Faculty adviser approval is required in advance.

Lower American history (two courses). Students select from the following: History 100, 103E, 140A, 140B, 141, 141B, 143, 145, 146; Latin American Studies 150. LAS 150 requires prior approval because topics change each semester; only history-related topics will be approved.

Upper Division Elective Courses (Five Courses): Methods (one course). The methodology requirement is designed to give each LAS major a set of analytical skills appropriate to the disciplinary and core focus of their individual program. The methods course is oriented to questions on research design and field methods. It is oriented to questions of survey design, field analysis, qualitative methods, and approaches to research design. An introductory course in these methods is also recommended as a prerequisite to these classes. Lists of approved courses can be obtained from the IAS office.

Four additional courses. Students choose their remaining four courses from an approved list available from the IAS office. At least 50 percent of each course's content must be devoted to Latin America. As this is an interdisciplinary major, the four courses must represent at least two disciplines. No more than two elective courses may be taken from the same department. Students can choose to focus all four courses around a central theme (e.g., gender and society, religion and society, popular culture, or development) or a geographical region (e.g., Mexico, Central America, or the Caribbean), although this is not required.

Graduate Program

Master's Degree. The M.A. program in Latin American studies is a two-year program that provides an opportunity for interdisciplinary study in Latin American studies at the graduate level. Candidates must have a bachelor's degree, a reading knowledge of either Spanish or Portuguese, and a high GPA. Applicants from the United States must take the Graduate Record Examination (GRE), and international students must take the Test of English as a Foreign Language (TOEFL).

Requirements for the M.A. degree: Under Plan I, the student completes 20 units of coursework and writes a master's thesis. Under Plan II, the student completes 24 units of coursework and takes a comprehensive oral exam. The courses, in both cases, must be concentrated primarily in two or three disciplines, although a broader range of courses may be taken if appropriate to the student's academic objectives. The program must include at least three courses or 12 units at the graduate level. (Credit earned for writing the master's thesis may not be included.) In addition, students are required to take Latin American Studies 200 and 250 their first semester. The remaining courses/units may be at either the undergraduate (lower division) or graduate level and must include at least one methodology course appropriate to the student's course of study that should be selected in consultation with the student's adviser. While a student's program must consist primarily of courses focused explicitly on Latin America, courses with a comparative, theoretical, or methodological focus in other disciplines may also be included. Courses must be approved by a faculty adviser or the IAS office for inclusion in the student's program.
Lower Division Courses

10. Introduction to Latin American Studies. (4) Three hours of lecture and one hour of discussion per week. This course is intended as a lower-division, interdisciplinary core course for students planning to pursue the Latin American studies major, as well as other interested students. The aim is to provide an introduction to the field that integrates the offerings from the various disciplines. Particular attention will be given to the analysis of the relationship between cultural expression and the politics, economy, and history of the region. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit as topics vary. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no-pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. (F,SP)

Upper Division Courses

130. Cross-Listed Topics. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: Consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to majors. Content and unit values vary from course to course. (F,SP)

150. Advanced Studies in Latin American Studies. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. This is an advanced seminar in Latin American studies. Students are encouraged to review and engage with seminar literature. Topics vary from semester to semester. (F,SP)

192. Senior Thesis. (3,4) Hours to be arranged. Prerequisites: Senior standing. This course is designed to provide a vehicle for undergraduate students who do not participate in the departmental Honors Program but are interested in writing a major paper on a Latin American topic. The paper should be approximately 30-50 pages in length; the topic must be agreed upon in advance by both the student and faculty sponsor. Requires weekly consultations with faculty sponsor. (F,SP)

H195. Senior Honors Thesis Seminar. (4) Three hours of seminar per week. Prerequisites: International and Area Studies 102 and consent of instructor; senior standing. The honors student is required to research and write a thesis based on the prospectus developed in International and Area Studies 102. The thesis work is reviewed by the honors instructor. A second reader is to be selected based on the thesis topic. Weekly reports required. (SP)

197. Field Studies. (1-4) Course may be repeated for credit. Regular individual meetings. Must be taken on a pass/no-pass basis. Prerequisites: Consent of instructor; upper division standing. Supervised experience relevant to specific aspects of Latin American studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a pass/no-pass basis. Prerequisites: Upper division standing and consent of instructor. Topics vary from semester to semester. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Individual meeting to be announced. Must be taken on a pass/no-pass basis. Prerequisites: Written proposal must be approved by faculty advisor; consent of instructor. Enrollment restricted by regulations of the college. (F,SP)

200. Latin American Studies Seminar. (1) Course may be repeated for credit. One and one-half hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Mandatory for Latin American studies graduate students. Seminars by faculty and advanced graduate students on their recent research on Latin America. (F)

220. Cross-Listed Topics. (1-4) Course may be repeated for credit. Consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to the graduate program in Latin American studies. Content varies from course to course. (F,SP)

250. Selected Topics in Latin American Studies. (1-4) Course may be repeated for credit with consent of instructor. Three hours of seminar per week. Seminar will take a multidisciplinary approach to specific geographical areas with appropriate comparative material included. Topics change each semester. (F,SP)

292. Directed Study and Research. (1-4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. Directed study and research for graduate students in Latin American studies. Primarily for graduate students engaged in an interdisciplinary exploration of Latin American-related topics in subject matter not covered in available course offerings. The course will involve directed readings and writing of a report. (F,SP)

298. Directed Graduate Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Prerequisites: Consent of instructor and graduate-level standing. Topics vary from semester to semester. (F,SP)

299. Individual Study. (1-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study for graduate students in Latin American studies. Intended to provide directed reading and supervision for thesis development or special study in Latin American area. (F)

502. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Independent study. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study in consultation with the major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)
Programs

The UC Berkeley School of Law offers a broad three-year curriculum leading to the Juris Doctor (J.D.) degree. Berkeley Law educates men and women not only for the practice of law but also for all the varied roles lawyers perform in modern society. The law school provides an intellectually challenging course of study that imparts the theoretical and practical skills necessary for effective, creative, and responsible legal counseling and advocacy. To this end, Berkeley Law’s curriculum is continually evolving. It currently includes specialized curricular programs in business, law, and economics; environmental law; international and comparative legal studies; and social justice and public interest.

The school is a member of the Association of American Law Schools and is accredited by the American Bar Association. Its graduates are qualified to become counselors for the practice in any state of the United States.

Berkeley Law does not require or even recommend a specific pre-law major. To prepare for law school, students should take courses that help them develop written and oral communication skills; increase analytical and problem-solving skills; obtain broad exposure to the humanities and social sciences in order to understand the social context within which legal problems arise; and acquire a general understanding of economics, because many legal problems relate to the economic functioning of society.

In selecting specific courses, consultation with an undergraduate adviser may be desirable. Berkeley Law seeks a student body with a broad set of interests, backgrounds, life experiences, and perspectives.

The school also offers programs, mainly for foreign-educated attorneys, that lead to the degree of Master of Laws (LL.M.) or the degree of Doctor of the Science of Law (J.S.D.).

For further information, contact the Berkeley Law Admissions office at (510) 642-2274 or visit law.berkeley.edu/admissions.htm.

Jurisprudence and Social Policy Program

Berkeley Law is unique among major U.S. law schools in offering a multidisciplinary graduate program in the social, philosophical, and humanistic studies of law, leading to a Master of Arts in Jurisprudence (M.A.) or a Doctor of the Science of Law (J.S.D.).

For more information, contact the Berkeley Law Admissions office at (510) 642-2274 or visit law.berkeley.edu/admissions.htm.
Classes
Lower Division Courses
offerings.
98. Directed Group Study. (1-4)
from department to department and from semester to semester. These seminars provide exposure to the insights of legal traditions other than their own. The courses from Area 3 are meant to acquaint students with selected forms of legal ordering (e.g., the substantive law of crimes, property, negligence) and to assure that the pre-graduate legal core requirement in social policies and historical contexts. The Area 4 requirement assures that students in the major have familiarity with some of the important aspects of legal procedure or, more broadly, legal process. These courses use relevant insights from the social sciences (e.g., organizational theory) to illuminate the dynamics of law-making, adjudication, and implementation.
Honors Program. With consent of the major adviser, a student majoring in legal studies with an overall Berkeley GPA of 3.3 and a GPA of 3.5 in legal studies courses may be admitted to the Honors Program. The honors student is required to first enroll in LS198, Honors Seminar, during the fall semester, then in H195A the following spring to prepare an honors thesis.
Further information on the major in legal studies, contact the program office and its website. Only some of the following courses are offered in any given year. See the online Schedule of Classes for up-to-date information on course offerings.
Lower Division Courses
R11B. Equal Rights in a Changing Society: 1954 to the Present. (4) Three hours of lecture per week. This course will examine three important institutions: school, work, and family. We will read memoir and drama that recounts how minority groups have experienced and understood changes to their legal rights within those institutions. We will examine school segregation, women in the workplace, and the legal status of same-sex marriage. Students will develop their ability to write, critically read, and analyze the written word through the research process and will complete a research portfolio. (F,SP) Bruce
19AC. Moral Politics and Legal Culture. (3) Three hours of lecture and one hour of discussion per week. This lower division course explores the uses of the law to resolve major social and policy conflicts. It explores the question whether using the legal system to address these disputes may introduce elements of social homogeneity and narrow the range of social conflict, affecting participants on all sides. Students will collaborate to research policy questions behind current moral conflicts. This course satisfies the American Cultures requirement. (F,SP) Echave and Simon.
39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore topical and methodological issues in a small-enrollment seminar. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.
98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. The Area 1 requirement insures that all students are exposed to conceptual analysis and broad intellectual perspectives. Area 2 courses are meant to limit parochialism and to insure that students have the capacity to draw on the insights of legal traditions other than their own. The courses from Area 3 are meant to acquaint students with selected forms of legal ordering (e.g., the substantive law of crimes, property, negligence) and to assure that the pre-graduate legal core requirement in social policies and historical contexts. The Area 4 requirement assures that students in the major have familiarity with some of the important aspects of legal procedure or, more broadly, legal process. These courses use relevant insights from the social sciences (e.g., organizational theory) to illuminate the dynamics of law-making, adjudication, and implementation.
Upper Division Courses
100A. Foundations of Legal Studies. (4) Three hours of lecture and one hour of discussion per week. This is a liberal arts course designed to introduce students to the foundational frameworks and cross-disciplinary perspectives of human and social sciences that distinguish legal studies as a scholarly field. It provides a comparative and historical introduction to forms, ideas, institutions, and systems of law and their relation to basic theoretical problems and scholarly methods for understanding questions of law and justice. (F,SP) Pery
102. Policing and Society. (4) Three hours of lecture and one hour of discussion per week. This course examines the American social institution of policing with particular attention to its history, goals, and outcomes. It explores the social, economic, and cultural forces that pull policing in the direction of state legal authority and power as well as those that are a counter-weight to the concentration of policing powers in the state. Special attention is given to how policing shapes and is shaped by the urban landscape, legal to cultural. (F,SP) Musheno
103. Theories of Law and Society. (4) Three hours of lecture. A historical examination of major interpretations of law, morals and social development, with special emphasis on the social thought of the 18th and 19th centuries, of crimes and criminals of Maine, Durkheim, Weber, and other contemporary figures. The topics include justifications of punishment, foundations of blame and responsibility, substantive values protected by criminal law, significance of actual harm, liability of groups and other collectivities, and virtues and limits of the rule of law. (F,SP)
107. Theories of Justice. (4) Three hours of lecture and one hour of discussion per week. Major perspectives in social and economic thought (e.g., natural law, natural right, laissez faire, possessive individualism, contractualism, pluralism, and social equality), as they affect contemporary discussion of "higher law," fairness, civic competence, and distributive justice. (F,SP)
109. Aims and Limits of the Criminal Law. (4) Three hours of lecture and one hour of discussion per week. Analysis of the capacity of criminal law to fulfill its aims. What are the aims of criminal law? How are they assigned relative priority? What principles can be identified to evaluate disapproved activities through criminal law? (F,SP)
111. The Making of Modern Constitutionalism. (4) Three hours of lecture and one hour of discussion per week. Historical examination of the emergence of "constitutionalism" as an authoritative approach to the study of law and politics; coverage from the 16th to 18th centuries, concluding in discussion of the debate over ratification of the U.S. Constitution. (F,SP)
116. Legal Discourse 1500-1700. (4) Three hours of lecture and one hour of discussion per week. This course focuses on the history of legal thought and legal discourse from the late medieval period to the Enlightenment. Topics include the relationship between legal thought and intellectual developments and the relationship between political and constitutional developments and legal discourse. Although the emphasis is on Europe, there will be some consideration of differences between English and continental European legal thought.
119. Philosophy and Law in Ancient Athens. (4) Three hours of lecture and one hour of discussion per week. This is an introduction to important aspects of the philosophical and constitutional thought of classical Athens. We will pay particular attention to arguments about the identity of law and legal obligations; and the context of the Athenian way of organizing trials, taxation, and administration. Readings from Aeschylus, Thucydides, Aristotle, Lysias, and others. (F,SP) Hoekstra
120. Philosophies of Punishment: Ancient to Modern. (4) Three hours of lecture and one hour of discussion per week. A comparison of the ancient and modern understanding of punishment prevailing in Anglo-American thought and in the Middle East, Medieval Europe, Ancient Israel, and Ancient Greece. The topics include wrongdoing; suffering; deterrence, vengeance, purgation; excuses; volition; determinism, fate; response responsibility. Most of the readings are in literary works such as the Greek tragedies. (F,SP)
121. Law in the Bible. (4) Three hours of lecture and one hour of discussion per week. Topics include law as the divine commands, the divine ordering of the creation, God's historical plan, wise maxims for successful living, the superseding of law by grace and divine freedom. Nearly all of the assigned readings are in the Bible. M. Smith
132. Immigration and Citizenship. (4) Three hours of lecture and one hour of discussion per week. We often hear that America is a “nation of immigrants.” This representation of the United States does not explain why some are presumed to belong and others are not. We will examine both historical and contemporary law of immigration and citizenship to see how law has shaped national identity and the identity of immigrant communities. In addition to scholarly texts, we will learn to read and analyze excerpts of cases and the statute that governs immigration and citizenship. The Immigration and Naturalization Act. (F,SP) Volpp
132AC. Immigration and Citizenship. (4) Three hours of lecture and one hour of discussion per week. We often hear that America is a “nation of immigrants.” This representation of the United States does not explain why some are presumed to belong and others are not. We will examine both historical and contemporary law of immigration and citizenship to see how law has shaped national identity and the identity of immigrant communities. In addition to scholarly texts, we will read and analyze excerpts of cases and the statute that governs immigration and citizenship: The Immigration and Naturalization Act. (F,SP) Volpp
138. The Supreme Court and Public Policy. (4) Three hours of lecture and one hour of discussion per week. This course examines a number of leading U.S. Supreme Court decisions in terms of what policy alternatives were available to the Court and why it chose one over another. Prospective costs and benefits of these alternatives and who will pay the costs and who gets the benefits of them are considered. Among the areas considered are economic development, regulation of business, national security, freedom of speech, and discrimination. Readings are solely of Supreme Court decisions. (F,SP) Shapiro
139. Comparative Perspectives on Norms and Legal Traditions. (4) Three hours of lecture and one hour of discussion per week. This course is an introduction to the comparative study of different legal cultures and traditions including common law, civil law, socialist law, and religious law. A section of the class will be dedicated to the study of a specific law and post-colonial legal process in Latin America and in Africa. (F,SP) Mayall
140. Property and Liberty. (4) Three hours of lecture and one hour of discussion per week. This course will examine the relationship between property law and limits of liberty in different cultural and historical settings. The course will cover theories of property law, slavery, the clash between aboriginal and European ideas of property, gender roles and property rights, common property rights and systems, zoning, regulatory takings, and property on the Internet. Readings will include legal theorists, court cases, and historical case studies. (F,SP)
145. Law and Economics I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites:
146. The Law and Economics of Innovation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Economics I or a course in microeconomics. The course will discuss how the operation of knowledge, artistic, literary, and musical works are supported in a competitive economy especially in the digital age. We will discuss intellectual property, copyrights, trade secrets, trademarks, and geographic indications, in historical and institutional contexts. We will consider the problems of competition that arise in the digital economy, such as Google Books, the Miramax consent cases, and search advertising. (F.SP) Schotchnyer

147. Law and Economics II. (4) Three hours of lecture and one hour of discussion per week. Law and Economics I is not a prerequisite for Law and Economics II. Students may take either or both courses. Government regulation, market mechanisms to license provision of goods and services. Economists and lawyers have developed a critique of these mechanisms which has prompted substantial reforms in recent years, e.g., deregulation in transportation. The course examines this critique. (F.SP)

151. Law, Self, and Society. (3) Two hours of lecture and one hour of discussion per week. Contemporary moral and political philosophy has been increasingly interested in how conceptions of the self relate to institutions and the role of our social and political life. These issues have an important bearing on legal theory as well. Law is shaped by certain implicit assumptions about the nature of individuals and collectives, while it also actively participates forming the identities of persons and in structuring collective entities such as families, corporations, and municipalities. This course will explore some theoretical approaches to the reciprocal relationship between law and the different social actors that it governs.

154. International Human Rights. (4) Three hours of lecture and one hour of discussion per week. International human rights are at the forefront of national and international politics. These discussions revolve around the recognition of human rights, existing institutions to protect human rights, and look forward to the future of human rights. (F.SP) Boyd

155. Government and the Family. (4) Three hours of lecture and one hour of discussion per week. How has the family been constructed and deconstructed? What are the boundaries of the family as we understand them? (F.SP) Hollinger

157. International Relations and International Law. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Minimum sophomore standing. This course will examine legal doctrine, feminist legal theory, and approaches to the subject of gender, law, and society. (F.SP) Guzman

158. Law and Development. (4) Three hours of lecture and one hour of discussion per week. Focusing on developing countries, this course considers the relationship between legal institutions and rules—including informal and traditional ones—and development, defined by different actors by economic growth, health, a wide spectrum of freedoms. It examines efforts by national leaders, international organizations, foreign aid agencies, and NGOs to "reform" law and development, along with the resistance and unplanned consequences that often ensue. (F.SP) O’Connell

160. Punishment, Culture, and Society. (4) Three hours of lecture and one hour of discussion per week. This course surveys the development of Western penal practices, institutions, and ideas (what David Garland calls “penality”) from the 18th-century period to the present. Our primary focus will be on penal practices and discourses in the United States in the early and mid-20th century. We will examine the extraordinary growth of U.S. penal sanctions in the last quarter century and the sources and consequences of what some have called “mass imprisonment.” (F.SP) Simon

161. Law in Chinese Society. (4) Three hours of lecture and one hour of discussion per week. This course examines concepts that form the basis of the Chinese legal system, traditional theories and institutions of pre-1911 society, and the expression and rejection of these traditions in the modern Nationalist period and the People’s Republic. (F.S.P)

163. Juvenile Delinquency and Juvenile Justice. (4) Three hours of lecture and one hour of discussion per week. This course examines the premises, doctrine, approaches, and juvenile courts, particularly in relation to the commission of seriously anti-social acts by mid-adolescents. Topics include the history of theories of delinquency; the prudence of delinquency; the incidence and severity of delinquency; policies toward offenders; the processes of juvenile courts and youth corrections; and reforms or alternatives to the juvenile court system.

168. Sex, Reproduction, and the Law. (4) Three hours of lecture and one hour of discussion per week. This course examines recent American legal and social history with respect to reproductive and sexual behavior. We will consider two theoretical aspects of the problem: (1) how law regulates social behavior and (2) more general theories about how reproduction is socially regulated. Armed with these theoretical perspectives, the course will then examine closely a number of legal/social contexts, including sterilization, abortion and contraception. (F.S.P)

170. Crime and Criminal Justice. (4) Three hours of lecture and one hour of discussion per week. Introduction to the etiology of crime and criminal justice administration. What is crime? What are the main features and nature of crime? When are crimes apprehended, tried, sentenced, punished? Past and current trends and policy issues will be discussed. (F.S.P)

171. European Legal History. (4) Three hours of lecture and one hour of discussion per week. Most students derive from one of the other of the two legal orders that developed in continental Europe and England over the course of the centuries. This course introduces students to some of the major legal traditions in the common law and civil law tradition, a tradition that has its origins in Roman law. We will look at the English common law tradition, which began to diverge from the law of continental Europe and began to develop its own distinctive character. (F.S.P) McClain

176. Twentieth-Century American Legal and Constitutional History. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Junior or senior standing. It is recommended that students have completed one or more of the following courses in legal history or political science that deals with American history or American government prior to taking 176. Development of American law and the constitutional system in the late 20th century. We will examine the Era Regulatory policy, criminal justice and relations, freedom of speech and press, New Deal legal innovations, modern tort liability, environmental regulation, judicial reform, and federalism. (F,SP)

177. Survey of American Legal and Constitutional History. (4) Three hours of lecture and one hour of discussion per week. We will survey legal and constitutional history from colonial times to the present. Topics include colonial legal institutions, early constitutional history, history of the common law, business, property, race and the legal profession, and the modern constitutional order. (F.S.P)

178. Seminar on American Legal and Constitutional History. (3) Two hours of seminar per week. Prerequisites: Consent of instructor. Enrollment is limited to upperclassmen who have demonstrated reading and independent research in the history of American law. Preference may be given to students who have taken 177.

179. Comparative Constitutional Law. (4) Three hours of lecture and one hour of discussion per week. An examination of the role of courts in making a constitution in a number of countries based on selected high court opinions.

181. Psychology and the Law. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Minimum sophomore standing. This course will examine the implications of psychological theory, policy, and practices. The course will analyze the psychological aspects of intent, responsibility, deterrence, retribution, and morality. We will consider the role of psychology to evidence law (e.g. witness testimony, psychiatric diagnosis, and prediction), procedure (e.g. trial conduct, jury selection), and topics in criminal tort and family law. (F.SP) MacCoun

182. Law, Politics, and Society. (4) Three hours of lecture and one hour of discussion per week. This course examines the theory and practice of legal institutions in performing several major functions of law: allocating authority, defining relationships, resolving conflicts, and maintaining social solidarity. In doing so, it will assess the nature and limits of law as well as consider alternative perspectives on social control and social change. (F,SP)

184. Sociology of Law. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Sociology 1, 3, 3AC, or consent of instructor. Selected legal rules, principles, and institutions from a sociological perspective. What does law mean for the regulation of social, and clinical psychology for legal theory, policies, and practices. The course will address the psychological aspects of intent, responsibility, deterrence, retribution, and morality. We will consider the role of psychology to evidence law (e.g. witness testimony, psychiatric diagnosis, and prediction), procedure (e.g. trial conduct, jury selection), and topics in criminal tort and family law. (F.SP) MacCoun

186. Gender, Law, and Society. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Minimum sophomore standing. This course examines how law affects women’s lives in legal and social contexts, and how assumptions about women and gender in the legal system help to socially construct and deconstruct the identities of persons and in structuring collective entities such as families, corporations, and municipalities. The course will explore some theoretical approaches to the reciprocal relationship between law and the different social actors that it governs.

189. Feminist Jurisprudence. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Minimum sophomore standing. This course will examine ways in which feminist theory has shaped conceptions of the law as well as examine a range of feminist legal theories, including equality, difference, dominance, intersectional, poststructural, critical legal, and queer theories. It will ask how these theories have shaped legal interventions in areas including workplace/educational access, sexual accessed, workplace conflict, “cultural” defenses, and globalized sweatshop labor. (F.SP) Abston

190. Seminar on Topics in Law and Society. (1-4) Course may be repeated with permission. Offered to four hours of seminar per week. Prerequisites: Consent of instruc-
Letters and Science
(College of Letters and Science)

Office: 101 Durant Hall, (510) 642-1483
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Mark A. Richards, Ph.D. (Executive Dean)

Divisional Deans:
Janet S. Broughton, Ph.D. (Dean, Arts and Humanities)
Mark Schissel, Ph.D. (Dean, Biological Sciences)
Mark A. Richards, Ph.D. (Dean, Mathematical and Physical Sciences)
Carla Hesse (Dean, Social Sciences)
Tyler Stovall, Ph.D. (Dean, Undergraduate Division)
Robert G. Jacobsen, Ph.D. (Associate Dean, Undergraduate Division)

The College of Letters and Science offers undergraduate students a variety of programs leading to the Bachelor of Arts degree in four academic years of full-time study. The first two years are a time of exploration and experimentation, leading to declaration of a major. In the last two years, students acquire and refine special knowledge as they focus on their major programs. The college's departments are devoted to instruction and research in a variety of academic subjects. Each department represents a style of study and communication and refined development of a set of structured ideas. The subjects of the departments overlap and complement one another.

Requirements for Admission in Advanced Standing

Students applying for admission will not be considered if they have completed more than 80 semester units (120 quarter units). The dean of the college makes exceptions to this policy only in unusual circumstances. Applicants with advanced-placement credit may, however, exceed the 80-semester-unit limitation by the amount of their advanced-placement course work, if they meet all other admission criteria.

Transfer students with 60 or more semester units are expected to have satisfied, before admission to the college, the Reading and Composition breadth requirement, the Foreign Language breadth requirement, and the Quantitative Reasoning breadth requirement of the college. Students who apply as intercampus transfers and who have completed all the Letters and Science requirements, or the equivalent of either, at the University of California campus from which they transfer may, upon petition, be credited with having completed the requirements of the college. Transfer students who apply from community colleges in California have the option of fulfilling the lower-division breadth requirements by completing the Intersegmental General Education Transfer Curriculum (IGETC). This program specifies a series of subject areas and types of courses that, if completed, will satisfy the lower-division breadth and general education requirements at any general campus of the University of California.

Note: In recent years, certain major programs have turned away qualified applicants because of space limitations. Students should be aware that admission to those majors in the college is competitive.

Biological Sciences Majors. Students planning to declare majors in a biological science must in addition to the college’s general education requirements have completed the minimum subject preparation in the major with a GPA of 2.00 (C average) or higher. The subject preparation listed below is minimal; transfer students who wish to declare a major in a biological science are urged to consult directly with the department or program in which they are interested to learn of additional requirements or of any restriction placed on entry to the major. The subject preparation for majors in the biological sciences is as follows.

Students who have completed 60 to 70 semester units:
(1) General chemistry with laboratory (equivalent to one year of Berkeley’s inorganic chemistry with laboratory).
(2) General biology with laboratory (equivalent to Berkeley’s Biology 1A-1B).

Students who have completed 71 to 80 semester units must complete in addition to points 1 and 2 above:
(3) Introductory organic chemistry with laboratory (equivalent to Berkeley’s organic chemistry with laboratory).

Requirements for the Bachelor of Arts Degree

Students must complete a minimum of 120 semester units, distributed according to regulations that are available at the Letters and Science web page at ls-advice.berkeley.edu/requirement/unit.html. A 15-unit class schedule per semester is considered to be a normal course load; a class list of fewer than 13 units requires special permission of the dean. There are also scholarship, minimum-progress, residence, breadth, and major requirements; these are described in the announcement as well. Brief descriptions of the breadth, major, and minor requirements appear below. Major and minor programs are outlined under the department, field, or group headings in this publication. In addition, students must satisfy the University requirements in Subject A, American History, and American Institutions, and the Berkeley campus American Cultures requirement.

Breadth Requirements. There are four breadth requirements.

(1) Reading and Composition. Students must normally complete the first half of the requirement (an “A” course) during the freshman year and the second half of the requirement (a “B” course) during the sophomore year. Students must complete the requirement through coursework according to the requirements of the semester system, either the coursework is undertaken at Berkeley or elsewhere.

(2) Quantitative Reasoning. This requirement may be fulfilled by satisfactory performance in an examination or by successful completion of an acceptable college course. Information about acceptable examinations and acceptable courses is included in the announcement. This requirement, if satisfied by coursework, must be completed without delay.

(3) Foreign Language. Students who have not satisfied the language requirement at the time of admission must complete it without delay. The requirement may be satisfied by: (a) completion of the third year of one foreign language in high school with a minimum grade of “C-” or by completion of the second semester of a Berkeley course, or its equivalent elsewhere, in one foreign language with a minimum grade of “C-” or (b) demonstration of equivalent proficiency through examination, including the College Entrance Examination Board Achievement Test, the CEEB Advanced Placement Examination (if taken before admission to the college), or an acceptable foreign language placement examination offered by a foreign language department at Berkeley or on another campus of the University of California.

(4) Seven-Course Breadth Requirement. Students must take one course from each of the following categories, with no more than two courses in the same department:
• one course in physical science;
• one course in biological science;
• one course in arts and literature;
• one course in historical studies;
• one course in philosophy and values;
• one course in international studies or participation in the University of California Education Abroad Program or a recognized equivalent; and
• one course in social and behavioral sciences.

These courses may be taken from the College of Letters and Science and the professional schools and colleges and may be taken at Berkeley or on another campus of the University of California. The requirement for students entering the University of California during the years 1970-1972 is one year of work in a foreign language.

Major Programs. All students must pursue and complete a major program, the object of which is to provide them with a limited experience in specialization. There are more than 60 departmental major programs ranging from the humanities (e.g., art, comparative literature, English, foreign languages, etc.) and the social sciences (e.g., anthropology, economics, geography, psychology, etc.), to the biological sciences (e.g., integrative biology, molecular and cell biology, etc.) and the physical sciences (e.g., geology, mathematics, statistics, etc.). In addition, there are group majors in American studies, Asian studies, Celtic studies, cognitive science, development studies, environmental sciences, environmental studies, film, Latin American studies, legal studies, media studies, Middle Eastern studies, peace and conflict studies, political economy, religious studies, social welfare. There are also field majors in the physical sciences and interdisciplinary studies. Moreover, students who have completed at least 60 semester units and at least one semester of enrollment at Berkeley, and who have attained a minimum 3.0 Berkeley and overall GPA may—with the permission of the dean and support of supervision of a college faculty member and a member who acts as second reader of the individual major thesis—pursue an individual major designed to satisfy special academic goals. Thus, the options available to students outside traditional disciplines are many and varied.

Minor Programs. Minor programs are intended as optional programs that will encourage coherence in the work that students undertake outside their major field(s) of study. Students may complete one or more minor programs, normally in a field both academically and administratively distinct from their major. The college has set the following minimum requirements for completion of a minor program:

Course requirements: A minimum of five upper division courses, completed on a letter-graded basis, are required for the minor. At least three of the five upper division courses must be completed at Berkeley.
GPA requirements: Students must maintain a minimum overall GPA of 2.0 in upper division courses required for the minor program. Students should consult the department or group in charge of the minor for additional requirements and be undecided about the major they would like to pursue. Admission to the minor and certification of completion of the minor are determined by the department or group in charge of the field of study. How can a student complete a minor program, the department or group in charge will notify the Office of the Registrar, so that the completion may be noted on the student’s transcript.

Additional minor programs are offered by other schools and colleges on campus. Consult their listings in this catalog for more information.

Undergraduate Division

The mission of the Undergraduate Division is to develop and administer innovative and interdisciplinary courses and programs in the College of Letters and Science that do not belong to a single department.

Undergraduate and Interdisciplinary Studies (UGIS) — 112 Wheeler Hall, (510) 642-4466 — administers the field major in interdisciplinary studies and the group majors in American studies, cognitive science, environmental sciences, media studies, and religious studies. Minor programs are offered in creative writing, disability studies, and religious studies. UGIS also supports the following majors in international and area studies: Asian studies, development studies, European studies, Latin American studies, Middle Eastern studies, peace and conflict studies, and political economy.

In addition to our interdisciplinary majors, the Undergraduate Division sponsors a wide range of academic programs and services for undergraduates. A world-class research university such as ours offers something special to undergraduates who know how to make the most of it, and the Undergraduate Division is a good starting place for students who seek close intellectual contact with faculty, either in a small seminar or in a research apprenticeship; for students who would like to apply for a national scholarship, etc. Some of the campuswide programs for undergraduates that are administered by the Undergraduate Division are described below:

College Writing Programs — 112 Wheeler Hall, (510) 642-5570 — is designed to help undergraduates establish fluency and control over their reading and writing skills.

Freshman and Sophomore Seminars are created and taught by faculty members from nearly every campus department. The office posts descriptions of these special course offerings to freshmen and sophomores who wish to know about entrepreneurship, its importance to our society, and its role in bringing new ideas to market. Students will understand the entrepreneurial business process and the importance of new opportunities within the college. Furthermore, those careers might lead. This class will explore the structure and framework of entrepreneurial endeavors — both inside and outside the business world. The course will involve questions such as What is entrepreneurship? How can you create and define competitive advantage? How can you think about people in the entrepreneurial context? What do you do when nothing works as planned? And, how do you focus on doing right and doing well? (F,SP) Walske

17. Literature and Culture of the Nordic World. (4) Students will receive 2 units of credit for 17 after taking Scandinavian 75. Three hours of lecture and one hour of discussion per week. College courses are designed to embody the mission of the College of Letters and Science by fostering and supporting the ideals of a liberal arts education at the highest level of excellence. This college course, whose full title is Northern Light, Northern Darkness: Literature and Culture of the Nordic World, will introduce the culture of the Scandinavian countries (Sweden, Norway, Denmark, and Iceland), focusing on selected historical moments and major figures. Lectures will cover cultural, political, and social issues. Course materials include sagas, fairytales, novels, and films. All readings in English. (F,SP) Sanders

20. Arts and Literature. Three to four hours of lecture and one hour of discussion per week. This course features significant engagement with arts, literature, or language, either through critical study of works of art or through the creation of art. Art enables us to see the familiar world with new, often questioning eyes, and makes distant times and places, characters, and issues come alive in our imagination, which is essential to almost all intellectual endeavor. The Arts and Literature breadth requirement is intended to provide students with knowledge and appreciation of the arts and literature so that, for the duration of their lives, engagement with art can be, variously, a wellspring of creativity, a lodestar for critical perspectives, and a touchstone of aesthetic quality — in sum, a continuing touchstone of aesthetic quality — in sum, a continuing touchstone of aesthetic quality. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week for fourteen weeks. One and one-half hours of seminar per week for ten weeks. Two hours of seminar per week for eight weeks. Three hours of seminar per week for six weeks. Three hours of seminar per week for five weeks. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminars Program has been designed to provide new students with the opportunity to explore an intellectual topic with a fac...
ulty seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

C30T. Drugs in the Brain. (3) Students will receive no credit for C30T after taking Molecular and Cell Biology 62 or C62, Letters and Science 19, or Psychology 119. Three hours of lecture and one hour of discussion per week. The history, chemical nature, botanical origins, and the human behavior of drugs such as stimulants, depressants, psychedelics, anabolics, antidepressants, antipsychotics, steroids, and other psychoactive substances of both natural and synthetic origin. The course will discuss the biological, chemical, and psychological background material for understanding the content of this course will be contained within the course itself. Also listed as Molecular and Cell Biology 62. (F,SP) Staff

C30U. Americans and the Global Forest. (4) Students will receive no credit for C30U after taking Environmental Science, Policy, and Management 11. Three hours of lecture and one hour of discussion per week. This course challenges students to think about how individual and American consumer decisions affect forest ecosystems around the world. A survey course that highlights the consequences of different ways of thinking about the forest as a global ecosystem and as recreation or timber resources. Freshmen and sophomores will be given. Only the basics of high school algebra and geometry will be used. Also listed as Physics C21. (SP) Staff

C30X. Big History—Cosmos, Earth, Life, and Humanity. (4) Three hours of lecture and one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Sophomore standing, except for freshmen who have previously taken 50. This course explores all four major regimes of history—cosmic history, Earth history, life history, and human history. Bringing together these normally unrelated topics, it seeks to understand the character of history by examining long-term trends and critical changes, by looking for common causes underlying historical change in all regimes, and by identifying the novelties that have made each regime unique. Numerous illustrative lecture demonstrations will be given. Only the basics of high school algebra and geometry will be used. Also listed as Earth and Planetary Science C51. (SP) Alvarez

C70U. Introduction to General Astronomy. (4) Students will receive no credit for C70U after taking Astronomy 7A or 7B; or Physics C21. (F,SP) Staff

C70V. Descriptive Introduction to Physics. (3) Students will receive no credit for C70V after taking Physics 10. Three hours of lecture and one hour of discussion per week. Prerequisites: Open to students with or without high school physics. The most interesting and important topics in physics, stressing conceptual understanding rather than math, with applications to current events. Topics covered may vary and may include energy and conservation, radioactivity, nuclear physics, the Theory of Relativity, lasers, explosions, earthquakes, superconductors, and quantum physics. Also listed as Physics C10. (F,SP) Staff

C70W. Physics and Music. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: Open to students with or without high school physics. What can we learn about the nature of reality and the ways that we humans have invented to discover how the world works? An exploration of how the world works through the physical principles encountered in the study of music. The applicable laws of mechanics, fundamentals of sound, harmonic content, principles of sound production in musical instruments, musical scales, and music theory will be included. Also listed as Physics C11. (SP) Staff

R44. Western Civilization. (5) Three to four hours of lecture and two hours of discussion per week. Prerequisites: Completion of UC Entry-Level Writing Examination, and either AP World History or C51. (SP)

R45. Baseball as History. (3) Three hours of lecture and one hour of discussion per week. This course explores the history of baseball as a metaphor for American history. The course will explore how baseball is a reflection of American society and how it has evolved over time. The course will cover the history of baseball from its origins in the 19th century to its modern-day relevance. (F,SP)

Physical Science. Two to four hours of lecture and one hour of discussion per week. Physical scientists seek to understand the Universe, from its microscopic substructure to its largest structures, from the Earth to the edge of the Universe and the beginning of time. Students fulfilling Physical Science breadth in the College of Letters and Science may be motivated by the pure pleasure of penetrating the mysteries of the Universe, or by more practical considerations such as a desire to take an intelligent stance on such topics as greenhouse gases and space exploration. Whether students opt for the practical or the theoretical or a combination of both, choosing a lower division course in this series will learn to formulate problems clearly and think quantitatively, critically, and abstractly. (F,SP)

C70T. The Planets. (3) Three hours of lecture per week. A tour of the mysteries and inner workings of our solar system. Why do they orbit the sun the way they do? How do planets form, and what are they made of? Why do some bizarre moons have oceans, volcanoes, and ice floes? What makes the Earth unique? Why is the Earth a common type of planet or some cosmic quirk? This course will introduce basic physics, chemistry, and math to understand planets, moons, rings, comets, asteroids, and atmospheres of other worlds, other worlds will help us save our own planet and help us understand our place in the Universe. Also listed as Astronomy C12 and Earth and Planetary Science C12. (F,SP)

C70F. Focus on the Stars. (3) Three hours of lecture and one hour of discussion per week. A description of modern astronomy with emphasis on the latest developments in our understanding of the universe. Additional topics optionally discussed include quasars, pulsars, black holes, and extraterrestrial communication, etc. Individual instructor's synopses vary from term to term. Also listed as Astronomy C10. (F) Filipenko

Letters and Science

C346
120. Arts and Literature. Three to four hours of lecture and one hour of discussion per week. This upper division course features significant engagement with art, literature, music, film, and theater. Either through critical analysis or through critical study of works of art or through the creation of art, art enables us to see the familiar world with new, often questioning eyes, and makes distant times and places, cultures, and societies alive in our own lives. The requirement is to understand human experiences and the creative arts in the world today. As connections to nations and cultures and social orders in the world today. As connections to nations and cultures and social orders in the world today, the Arts and Literature breadth requirement is intended to provide students with knowledge and appreciation of the creative arts so that, for the duration of their lives, they have the ability to see the world in a new way, to focus on the distinction between the present and previous eras, they will come away with a richer understanding of and appreciation for human experience. (F,SP)

C140T. Marx, Nietzsche, Freud. (4) Students will receive no credit for C140T after taking German 157B. Three hours of lecture and one hour of discussion per week. The aim of the course is to explore the central theoretical and philosophical premises of three of the most influential thinkers in the German-speaking world and to examine in detail several works in which problems of history, ideology, values, and methodology are considered. Lecture and readings in English. Also listed as German C157B. (F,SP) Holub

C140U. The Archaeology of Health and Disease. (4) Three hours of lecture and one hour of laboratory per week. This course explores how archaeologists and bioarchaeologists study human families’ and communities’ conceptualizations and experiences of health and healing across cultures and through time. Students will be exposed to case studies drawing upon skeletal and material cultural evidence. Also listed as Anthropology C129F. (F,SP) Sargent

C140V. The History and Practice of Human Rights. (4) Students will receive no credit for C140V after taking Letters and Science 1460. Three hours of lecture and one hour of discussion per week. A required class for students in the human rights minor (but open to others), this course examines the development of human rights. More than a history of origins, it explores the human events, institutions, and activities of the past, present, and future. Overview of ethnogeology and science and one hour of discussion per week. This course will take an interdisciplinary approach to an understanding of happiness. The first part of the course will focus on the different treatments of happiness in the world’s philosophical traditions, focusing on close-up on conceptions or the good life in classical Greek and Judeo-Christian thought, the great traditions in East Asian thought (Taoism, Buddhism, Confucianism), and ideas about happiness that emerged more recently in the age of Enlightenment. With these different perspectives as a framework, the course will then turn to treatments of happiness in the behavioral sciences, evolutionary scholarship, and neuroscience. Special emphasis will be given to understanding how happiness arises in experiences of the moral emotions, including gratitude, compassion, reverence and awe, as well as aesthetic emotions like humor and beauty. Also listed as Psychology C162.

170AC. Crossroads of Earth Resources and Society. (4) Three hours of lecture and one hour of discussion per week. The course provides an introduction to the changing earth systems. The theme of the course will be to understand the changing landscapes, their impacts on human societies, and the responses of human societies to these changes. The course will be taught by two American Studies faculty members who have expertise in the evolution of human societies. The course will be taught by two American Studies faculty members who have expertise in the evolution of human societies, and the responses of human societies to these changes. Also listed as Anthropology C136K. (F,SP)

180. Social and Behavioral Sciences. Three to four hours of lecture and one hour of discussion per week. Upper division courses in this Series provide students with core concepts and tools they need to analyze the determinants of human behavior and the dynamics of social interaction among human beings. While fulfilling this breadth requirement, students may elect to take classes with a fresh perspective; every encounter or gathering provides an opportunity to observe society in action. Students of the College of Letters and Science will gain an appreciation of the origins and evolution of work and one hour of discussion per week. According to Aristotle, every exercise of our faculties has some goal for its aim. Every discipline taught in the College of Letters and Science has ethical implications, and to study a particular subject without considering these implications can be a sterile—and in extreme cases hazardous—exercise. The urge and the ability to ask questions of the world and of ourselves, as well as the questioning eyes, and makes distant times and places, cultures, and societies alive in our own lives. The requirement is to understand human experiences and the creative arts in the world today, as connections to nations and cultures and social orders in the world today, the Arts and Literature breadth requirement is intended to provide students with knowledge and appreciation of the creative arts so that, for the duration of their lives, they have the ability to see the world in a new way, to focus on the distinction between the present and previous eras, they will come away with a richer understanding of and appreciation for human experience. (F,SP)

C180T. Language and Power. (4) Three hours of lecture and one hour of discussion per week. Multi-disciplinary explorations into the origins, nature, and exercise of language as social symbolic power, drawing on readings taken from anthropology, social and cultural theory, and critical theory. Topics include language and myth, the meaning of meaning, the economy of verbal exchanges, perspective and ideology in language, institutional discourse, gender and power, and linguistic imperialism. Also listed as German C109. Kransch

C180U. Wealth and Poverty. (4) Students will receive no credit for C180U after taking Public Policy 103. Two hours of lecture and two hours of discussion per week. This course is designed to provide students with a deeper understanding of the determinants of wealth, poverty, and inequality in the United States and other advanced economies and of the implications of wealth, poverty, and inequality for social and political stability. Also listed as Public Policy C103. (SP)

C180V. Social Psychology: Self and Society. (4) Students will receive no credit for C180V after taking Sociology 150A or C150A; a deficiency in Sociology 150A or C150A may be removed by taking C180V. Three hours of lecture per week. This survey course provides tools from social psychology to help students develop a better understanding of their own and others’ behavior. Social psychology is a field that bridges sociology and psychology and is primarily concerned with how individuals view and interact with one another in everyday life. The class is organized around a survey of the great ideas from the history of social psychology. We will study research on a wide variety of topics including conformity, obedience, identity, power, status, and interpersonal perception. Also listed as Sociology C150A. (F,SP)

C180W. Who Owns the Past? Cultural Heritage in a Digital Age. (4) Students who have taken Letters and Science 127 receive no credit for this course. Three hours of lecture and one hour of discussion per week. A cross-disciplinary exploration of cultural heritage on a global and local scale through discussion, debate, in-class activities, and team-based research projects that draw attention to the impacts of digital technology. Themes include the creation and management of heritage sites; the ethics of archaeologists as stewards of heritage; listening to multiple voices of interest groups and powerholders, and the preservation, conservation, and public presentation of heritage. Also listed as Anthropology C136K. (F,SP)
Upper Division Requirements: The major consists of a four-course core (Linguistics 110, 115, 120, and 130) which includes phonetics and phonology, morphology, syntax and semantics, and language history.

Three or four other courses totaling a minimum of 10 additional upper division units are added to the core through consultations between students and major advisers to complete the major’s minimum degree requirement of 80 units. Five must be selected from upper division and graduate-level offerings within the Department of Linguistics. The remaining five upper division units may be courses outside the department, but must be strongly related to linguistics. A list of pre-approved courses can be found on the department website. Courses not on the pre-approved list require the prior written consent of an undergraduate adviser to be counted in fulfillment of Department of Linguistics requirements.

Because the major varies greatly from student to student, each student is encouraged to plan a program of study with an undergraduate adviser and see the adviser on a regular basis (at least once a semester).

Honors Program. With the approval of the major adviser, a student with a GPA of 3.5 or higher, both overall and in the major, may apply for admission to the Honors Program. This consists of 12-14 units of Linguistics H195A/B units per semester for at least two semesters. Under the direction of a faculty member, students carry out an approved program of independent study in which they attain a reasonable mastery of an appropriate linguistic topic. As evidence of this work, students must submit an acceptable thesis summarizing critically the material they have covered and are invited to give a brief synopsis of their research at the under-graduate honors colloquium held in early May each year.

The Minor

Many students not majoring in linguistics find it useful to take several courses in linguistics during their undergraduate careers to complement their major work. A minor in linguistics gives students official recognition for having completed a linguistics subspecialization.

Prerequisites: Linguistics 100 with minimum grade of C.

Upper Division Requirements: Four courses in linguistics. Two of the four must be from the core list: Linguistics 110, 115, 120, 130. The third must be taken in the department and may but need not be on the core list. The fourth may be taken outside the department as long as it is on a list of pre-approved linguistics electives.

Graduate Programs

The Department of Linguistics takes a broad approach to the study of language. The department covers not only the standard “core” areas of phonology, morphology, syntax, and semantics, but also historical linguistics, field linguistics and language documentation, cognitive linguistics, psycholinguistics, and language in society. The graduate program trains students to do the kind of research that seeks to discover and provide explanations for general properties of linguistic form, meaning, and usage. The department has a strong commitment to languages documentation as well as to cutting edge theoretical training.

Preparation for Graduate Study in Linguistics. Graduate students in linguistics should have an undergraduate major in linguistics, or some equivalent acceptable to the department. They should be prepared to pass the major language and foreign language reading examinations early in their graduate career.

Master’s Degree in Linguistics. Students may follow either Plan I or Plan II for the master’s degree. Plan I requires 25 units plus a thesis. (No course units are granted for the thesis itself.) Plan II requires 30 units. Both plans include at their culmination, normally at the end of the second year, a two-hour comprehensive oral examination. Required courses for the linguistics M.A. are 110, 200, 211A, 220A, 230; one course from the Structures set (211B, 215, 220B); one course from the Ecologies set (105, 123, 181, 205, 250A, 250B, 250C, 250D, 250E, 250F, 255E, and either the year-long sequence 240A, 240B, or one course from the Advanced Analysis set (205, 210, 211B, 215, 220B, 231, 234, 245, 250A, 250B, 250C, 250D, 255E, 270, 275, 280A). Note: The course used to satisfy the Structures or Advanced Analysis requirement may also be used to satisfy the Structures or Ecologies requirement.) Students must satisfy at least one of these two requirements—Field Methods or Advanced Analysis—for the M.A. degree. Students who pass the M.A. exam and are recommended to continue into the Ph.D. program are required to satisfy both of these requirements by the end of their second year.

Doctoral Degree in Linguistics. The doctoral program requires an M.A. in linguistics from Berkeley, and follows the requirements described in the doctoral section of this catalog with some augmentations. For information on the further requirements, visit the department website at linguistics.berkeley.edu.

Linguistic Society of America Summer Institute. In the United States, the principal scholarly organization representing the field of linguistics is the Linguistic Society of America (1325 19th Street N.W., Suite 211, Washington, D.C. 20036-6501; (202) 835-1714; lsa.org). The organization sponsors a six-week summer institute in linguistics every other year, in collaboration with a co-sponsoring university. Both graduate and advanced undergraduate-level students are strongly encouraged to take part in these programs, which provide exposure to developments in the field and areas of interest that no single university can offer. Lower Division Courses

5. Language and Linguistics. (4) Three hours of lecture and one hour of discussion per week. A general survey of the field of linguistics. Students are introduced to a wide range of data from diverse languages to basic principles of linguistic analysis. (F, SP)

R6. Endangered Languages: What we lose when a language dies. (4) Three hours of lecture per week. In this course, we will investigate such questions as: What can languages tell us about the human mind, and why do they matter? Can dying languages be revitalized? How are they thought, identified, and culturally influenced by language, and vice versa? The course is designed to hone students’ reading, writing, and research skills. Satisfies the second half of the Reading and Composition requirement. (F, SP)

11. Writing Systems. (3) Three hours of lecture per week. Examines different writing systems in terms of their historical origin and their cognitive properties. (I) Enrolled limited to 15 students.


24. Freshman Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all
The C105. The Mind and Language. (4)

listed as Cognitive Science C104.

issues with the tools to analyze the framing of, and
to provide students interested in political and social
logic of political thought. The purpose of the course is
contested concepts, conceptual metaphor, metonymy,
hours of lecture and one hour of discussion per week.

C104. The Mind, Language, and Politics. (4)

Three

Upper Division Courses

100. Introduction to Linguistic Science. (4)

Three hours of lecture and one hour of discussion per week.

An intensive introduction of linguistic analysis, includ-
ing core areas such as phonetics and phonology, mor-
phology, and syntax and semantics, with data from a range
of languages. Argumentation and writing skills are
developed through substantial weekly homework
assignments. (F,SP)

C104. The Mind, Language, and Politics. (4)

Three hours of lecture and one hour of discussion per week.

An analysis of contemporary liberal and conservative
thought and language, in terms of the basic mecha-
nisms of mind: frames, prototypes, radical categories,
contested concepts, conceptual metaphor, metonymy,
and analogy. The framing of political discourse.
The logic of political thought. The purpose of the course is
to provide students interested in political and social
issues with the tools to analyze the framing of, and
logic behind contemporary policy discourse. Also
listed as Cognitive Science C104. G. Lakoff

C105. The Mind and Language. (4)

Three hours of lecture and one hour of discussion per week. For-
ermore 105. Conceptual systems and language from the
perspective of cognitive science. How language gives
rise to our conceptual structure, reasoning, category-
formation, metaphorical understanding, and the
framing of experience. Cognitive versus formal lin-
guistics. Implications from and for philosophy, anthro-
pology, literature, artificial intelligence, and politics.
Also listed as Cognitive Science C101. (SP) G. Lakoff,
E. Sweetser

106. Metaphor. (4)

Three hours of lecture and one hour of discussion per week.
Prerequisites: Lower division students must have instructor approval. The
role of metaphor in framing our everyday language,
conceptual system, and world view. Topics include
cross-cultural differences, literary metaphor, sound
symbolism, and related theoretical issues in philoso-
phy, psychology, and anthropology. G. Lakoff,

Sweetser

C108. The Challenge of Cognitive Science to West-
ern Philosophy. (4)

Three hours of lecture/discus-
sion per week. Prerequisites: Some background in
either cognitive science or philosophy. Three major
results of cognitive science are inconsistent with most
of Western philosophy: the embodiment of mind,
the cognitive unconscious, and metaphorical thought.
The course rethinks philosophy from a cognitive
science perspective, including basic philosophical
concepts—time events, causation, the mind, the self,
and morality—and the cognitive structure of the philo-
sophical theories of the Presocratics, Plato, Aristotle,
Descartes, Kant, analytic philosophy (especially
Wittgenstein), and Chomsky. Also listed as Cognitive
Science C108. G. Lakoff

C109. The Neural Basis of Thought and Language. (4)

Three hours of lecture and one hour of discussion per week. Prerequisites: Computer Science 61B; and
Cognitive Science C101, C105 or Cognitive Science
Psychology C102B; or consent of instructor. This is a
course on the current status of interdisciplinary
studies that seeks to answer the following questions:
(1) How is it possible for the human brain, which is a
network of neurons, to think and learn, use, and understand language?
(2) How are language and thought related to percep-
tion, motor control, and our other neural systems,
including our non-symbolic sensory systems? How do the cognitive
structural properties of neural systems and the specific
neural structures of the human brain shape the nature
of thought and language? Much of the course will
focus on (1) how the symbolic (NTL) and non-symbolic (
non-NTL) aspects of language, which seeks to answer these questions in terms of archi-
tecture and mechanism, using models and simulations
of language and learning phenomena. Also listed as
Cognitive Science C116. (SP)

110. Introduction to Phonetics and Phonology. (4)

Three hours of lecture and one hour of discussion per week.
Prerequisites: 100 or concurrent enrollment or graduate status.
Introduction to: (1) phonetic trans-
scription of speech using the International Phonetic Alphabet, (2) psycho-
logical and cognitive aspects of speech production and perception, and (4) phonological analysis of lan-
guage sound systems.

113. Experimental Phonetics. (3)

Three hours of lecture per week. Prerequisites: 110. Practical training in experimental phonetics; acoustic, physiological,
and perceptual analysis of speech.

115. Phonology and Morphology. (4)

Three hours of lecture and one hour of discussion per week. Prereq-
usites: 100. Introduction to important cross-linguistic phonological and morphological phenomena as well as
standard methods of description and analysis. (SP)

120. Introduction to Syntax and Semantics. (4)

Three hours of lecture and one hour of discussion per week.
Prerequisites: 100. An introduction to the study of
the structural properties of sentences and the con-
nections between sentence structure and sentence
meaning. (SP)

121. Logical Semantics. (3)

Three hours of lecture per week. Prerequisites: 120 or consent of instructor. Basic logical concepts. Truth, denotation, and their
relation. Models and interpretation. Translation from natural language to logical language. Deduc-
tion, quantification and scope. Intensionality, con-
text-dependency, and presupposition.

122. Language Typology and Linguistic Univer-
sals. (3)

Three hours of lecture per week. Prerequi-
sites: 100. Introduction to language typology and linguistic universals. An examination of various linguistic sub-
systems in different languages. Topics will include
interrogatives, pronoun systems, relative clause
formation, case systems, etc.

123. Pragmatics. (3)

Three hours of lecture per week. Prerequisites: Computer Science
use and human actions. Some topics to be empha-
sized are conversational logic, speech act theory,
politeness, social role, psychological perception of one-
self and language use. (SP) G. Lakoff

124. Discourse. (3)

Three hours of lecture per week. Prerequisites: 100. Language beyond the sentence. Global and local properties of connected speech and
writing. Narrative structures, new and old informa-
tion, subjects and topics, foregrounding and back-
grounding, and the role of presupposition.

127. Cross-Cultural Verbal Art. (3)

Three hours of lecture per week. This course examines parallels and differences between language art in different cultures,
both at the level of form (linguistic parallelism, rhyme,
alliteration) and meaning (how is metaphor used?
what rhetorical patterns are artistic?). This course is intended to help students develop a sense of what artistic language is, crossculturally, and to let them examine a chosen detail for
their project. The course readings and the theoreti-
cal models will be drawn equally from anthropology
and linguistics.

128. Linguistic Analysis of Literature. (3)

Three hours of lecture per week. Prerequisites: 100 or con-
currency given to free choice of source or con-
sent of instructor. Literary texts provide unique mate-
rial for linguists: good authors manage to use everyday grammatical forms in exceptional ways. In this course,
students will read scholarly linguistic works on liter-
ary analysis, and also original literary texts using
the tools they acquire. Linguistics readings will focus on
narratology and cognitive linguistic approaches, in-
cluding mental spaces theory, conceptual metaphor theory,
mental imagery, viewpoint, and causal struc-
ture. (F,SP) Sweetser

130. Comparative and Historical Linguistics. (4)

Three hours of lecture and one hour of discussion per week.
Prerequisites: 100. Methods of reconstruction. Types and explanations of language change. Dialect-
tology. The establishment of language relationships
and subgroupings. (F)

131. Indo-European Comparative Linguistics. (3)

Three hours of lecture per week. Prerequisites: 130. The affinities of the Indo-European languages and
the reconstruction of their common ancestor.

C139. Language Spread. (3)

Three hours of lecture per week. Prerequisites: 100 or con-
current enrollment or consent of instructor. Linguistic background and the gen-
eral principles of language spread. Mechanisms of
language spread, including creolization-decocoliza-
tion and language planning, and the role of bilingualism.
Case studies in language spread, including Aus-
tonesian, Indo-European, Amerindian, Uralic, African,
Sinitic, and Australian languages. Relationship of lan-
guage spread to immigration and contact. Also
listed as Slavic Languages and Literatures C139. Staff

140. Introduction to Field Methods. (3)

Three hours of lecture per week. Prerequisites: 110 and 115.
Training in the discrimination and transcription of the
sounds of a particular language. Methods and practice in
collecting and processing data from a particular
language.

141. Empiricism and Linguistics. (3)

Three hours of lecture per week. Prerequisites: 5 or 100. This course considers the status of linguistics as a scientific discipline.
Methodological presuppositions and the type of information that serve as data in linguistics are surveyed and placed in the context of other social
science methodology and data. Throughout the
course, the practice of linguistics as the science of
language is placed in the context of thought on the
philosophy of science. Students design and carry out projects using subject
methodologies (introspection, corpus, statistical, field-
work, experimental). (F,SP)

C142. Language and Thought. (3)

Three hours of seminar per week. Prerequisites: Cognitive Science C1 or equivalent. This seminar explores the relation of
language and thought. Is language uniquely human, and if so, what makes this unique about the human mind? Does the particular language you speak affect
the way you think, or do human languages reflect a universal conceptual repertoire? The goal of this class is to familiarize you with a set of classic arguments
on these themes, together with current research that evaluates these arguments, through weekly reading and
discussion. Also listed as Cognitive Science C142. (SP)

Regier

C147. Language Disorders. (3)

Three hours of lecture per week. Prerequisites: 100. An intro-
duction to experimental and theoretical research on
language disorders, particularly acquired aphasia in
adults. Major course themes include the relationship
between formal and natural language, and the use-
fulness of linguistic analysis for empirical research.
Topics include phonetic, phonological, morphologi-
cal, semantic, syntactic, and pragmatic aspects of
language disorders in mono- and multilingual speak-
198. Directed Group Study and Research. (1-4) Course may be repeated for credit. Hours to be arranged. Sections 1-4 to be graded on a passed/not passed basis. Section 5 to be graded on a letter-grade basis. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. (F,SP)

Graduate Courses

200. Graduate Proseminar in Linguistics. (1) Two hours of seminar per week. Required of graduate students during their first year. 

201. Advanced Graduate Proseminar in Linguistics. (2) Course must be taken at the beginning of graduate student’s third year. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: M.A. requirements should be completed or instructor approval. The course is designed to help students become professional linguists by showing them how to write abstracts of papers, how to prepare papers for presentation at conferences, and how to prepare written versions of papers for submission as qualifying papers (and for journal publication). A significant part of the course includes practical experience in the public presentation of their work. (F)

205. Advanced Cognitive Linguistics. (3) Three hours of lecture per week. Prerequisites: 105. Graduate standing or consent of instructor. This will be an advanced course in cognitive linguistics and, in the course of the semester, students will be expected to do original field work. The language covered will be a prototypical language for each of the major subfields of cognitive linguistics. (F)

210. Phonetic Theory. (3) Three hours of seminar per week. Prerequisites: 110. Graduate standing or consent of instructor. A reading course focusing on the acquisition of phonological systems. It will be the basis of training in phonological and phonetic methods used in the analysis of language. This course will also cover historical linguistics. (F,SP)

211A. Advanced Phonological Theory. (3) Three hours of lecture per week. Prerequisites: 110. Graduate standing or consent of instructor. Introduction to phonological theory at the graduate level with emphasis on cross-linguistic phonological patterns. (SP)

211B. Topics in Phonological Theory. (3) Three hours of lecture per week. Prerequisites: 211A. Continuation of 211A focusing on topics of current interest in phonological theory. (F)

215. Advanced Morphology. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 211A. Graduate standing or consent of instructor. Examination of complex morphological systems. Issues in the theory of word morphology. (F)

220A. Syntax and Semantics 1. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Formerly 220. This course aims at developing a solid conceptual, analytical, and empirical foundation for doing research in syntax and semantics. The emphasis is on gaining familiarity with the central problems in syntax and semantics, including syntactic and semantic analysis, theoretical foundations, and core syntactic notions, methodology, and argumentation. (F) Mikkelsen, Nichols

220B. Syntax and Semantics II. (3) Three hours of lecture per week. Prerequisites: 220A. This course continues 220A with an in-depth examination of selected syntactic and semantic phenomena in a variety of languages. The course is designed to help students become theoretical linguists by showing them how to write abstracts of papers, how to prepare papers for presentation at conferences, and how to prepare written versions of papers for submission as qualifying papers (and for journal publication). A significant part of the course includes practical experience in the public presentation of their work. (SP)

250A. Variation. (3)

250C. Language and Gender. (3)

250D. Conversation/Dialogue Analysis; and Endangered Languages—represent five major foci of current socio-linguistic interest. Students will be exposed to historical overviews, readings, discussions, and demonstrations of methods and will be expected to do original field research, the results of which are to be presented orally in a 15- to 25-page research paper. (F,SP) R. Lakoff, Michael

250F. Endangered Languages. (3)

270. Structure of a Particular Language. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 211A and 220A. This course continues 220A with an in-depth examination of selected syntactic and semantic phenomena in a variety of languages. The language investigated changes from year to year.
Logic and the Methodology of Science
(College of Letters and Science)

Group Office: 910 Evans Hall, (510) 642-0665
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Professors
Robert M. Anderson, Ph.D. Nonstandard analysis
(Philosophy)
Brandon Felsen, Ph.D. Philosophy of science, logic, automated reasoning
(Philosophy)
Leo A. Harrington, Ph.D. Recursion theory, model theory, set theory
(Mathematics, Emeritus)
John MacFarlane, Ph.D. Philosophy of Logic, philosophy of language and ancient philosophy
(Mathematics, Emeritus)
Pablo Mancosu, Ph.D. Logic, philosophy of mathematics
(Mathematics, Emeritus)
George Necula, Ph.D. Electronic engineering and computer science, computer science, computer and information theory
(Mathematics, Emeritus)
Christos Papadimitriou, Ph.D. Algorithms, computational complexity (Computer Science)
Sherrilyn Roush, Ph.D. Philosophy of science, epistemology, probability (Philosophy)
Thomas Scanlan, Ph.D. Model theory and diophantine geometry (Mathematics)
Theodore A. Slaman, Ph.D. Recursion theory (Mathematics)
Hans Sluga, B.Phil., Ph.D. History of logic, philosophy of mathematics (Philosophy)
John Steel, Ph.D. Set theory, descriptive set theory, inner model theory (Mathematics)
Unmesh V. Vazirani, Ph.D. Complexity theory, cryptography
W. Hugh Woodin, Ph.D. Large cardinals, determinacy and inner models theory (Mathematics, Emeritus)
John W. Addison Jr., (Mathematics, Emeritus), Ph.D.
David Blackwell, M.A., Ph.D. (Mathematics, Emeritus), Ph.D.
Manuel Blum (Electrical Engineering and Computer Science, Emeritus)
Charles S. Chihara (Philosophy Emeritus), Ph.D.
Alan Code (Philosophy Emeritus), Ph.D.
William Craig (Philosophy Emeritus), Ph.D.
Richard M. Karp (Electrical Engineering and Computer Science, Emeritus), Ph.D.
Paul Kay (Linguistics Emeritus), Ph.D.
Ralph N. McKenzie (Mathematics Emeritus), Ph.D.
Jack Silver (Mathematics, Emeritus), Ph.D.
J. Frits Staal (Philosophy Emeritus), Ph.D.
Lall A. Zadeh (Electrical Engineering and Computer Science Emeritus), Ph.D.

Overview

The Group in Logic and the Methodology of Science offers an interdisciplinary program of study and research leading to the Ph.D. degree. Although the Departments of Mathematics and Philosophy each offers a Ph.D. degree toward which a student may write a dissertation in logic, the interdisciplinary program is designed for students with a broad interest in logic and the methodology of science wishing to be knowledgeable in both its mathematical and philosophical aspects. Methodology of science is here understood to mean metascience, the study of the methods of the sciences, logical and mathematical means. The program is administered by an interdepartmental group which cooperates closely with the Computer Science Division, and the Departments of Mathematics and Philosophy.

Preparation. For admission to the graduate program, students must have completed an undergraduate major in philosophy, or mathematics, or a joint major in both, including at least one full-year upper division course in logic. In addition, they must have completed: (1) at least one upper division course in some science, and (2) at least one full-year upper division course in mathematics (other than logic) if the undergraduate major was philosophy; or (other than logic) if the undergraduate major was mathematics. Exceptions to these requirements are permitted only at the discretion of the graduate adviser.

The group in Logic and the Methodology of Science offers a course titled "Introduction to Computers." This course introduces students to the basic concepts and techniques of computer science, with a focus on applications in the field of logic. Students enrolled in this course will gain a foundational understanding of computer science concepts, including algorithms, data structures, and computational logic. The course is designed to provide a comprehensive introduction to the field of logic and the Methodology of Science for students who are interested in pursuing a research career in this area.
Overview
The Department of Materials Science and Engineering (MSE) administers undergraduate and graduate programs in materials science and engineering. In addition, undergraduate students may be admitted to one of five joint major programs.

Materials science and engineering encompasses natural and man-made materials—their extraction, synthesis, processing, properties, characterization, and development for technological uses. Advanced engineering activities that depend upon optimized materials include the energy technologies, photonics, electronic devices, and fuel cells, new medical devices and the healthcare industries, electronics and photonics, transportation, communication, and nanotechnology.

Students in materials science and engineering apply a basic foundation of mathematics, chemistry, physics, and engineering to fields of specialization that include biomaterials; electronic, magnetic, and optical materials; materials for energy technologies; structural materials; chemical and electrochemical materials science and engineering; and computational materials science and engineering. Nanoscale science and engineering plays an important role in all of these specializations.

See the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study at coe.berkeley.edu/college-of-engineering-announcement for more information.

Biomaterials. Traditionally, biomaterials include synthetic alternatives to the natural materials found in the human body. A central limitation in the performance of traditional materials used in the medical device, biotechnological, and pharmaceutical industries is their inability to integrate with biological systems through extracellular matrix, functionalized surfaces, and other molecular pathways, which has relegated biomaterials to a passive role dictated by the constituents of a particular environment. The design and synthesis of materials that circumvent their passive behavior in complex mammalian cells is a major focus of the work conducted within the Department of Materials Science and Engineering at Berkeley.

Chemical and Electrochemical Materials Science and Engineering. This area integrates the chemical and electrochemical processing of materials and the chemical and electrochemical behavior of materials. The former includes the scientific and engineering principles used in mineral processing, fuel cell systems, and refining materials, along with numerous etching and deposition techniques. The latter includes the environmental degradation of materials, the compatibility of materials with specific environments, and the fundamental science and engineering development of materials used in advanced energy production and storage devices.

Computational Materials Science and Engineering. Computational methods are native to all facets of materials science and engineering. Such methods range from the theoretical prediction of the electronic and structural properties of materials to modeling fluid flow in advanced batteries, or modeling the chemical kinetics and equilibria in a materials processing operation.

Electronic, Magnetic, and Optical Materials. This group of materials is defined by its functionality. Semiconductors, metals, and ceramics are used today to form highly complex systems such as integrated electronic circuits, optoelectronic devices, and magnetic and optical mass storage media. In intimate contact, these materials with precisely controlled properties perform numerous functions, including the acquisition, processing, transmission, storage, and display of information. Materials research in this area combines the fundamental principles of solid state physics and chemistry with many branches of engineering.

Materials for Energy Technologies. Materials play a crucial enabling role in the energy technologies. All facets of energy harvesting, energy conversion, energy storage, energy delivery, and energy conservation are all included in this topic. Specific examples include photovoltaics, nuclear, solar, thermoelectrics, fuel cells, mechanical transducers, batteries, supercapacitors, low loss conductors, low density foams for weight savings, and integrated materials systems for automated control of energy utilization.

Nanomaterials. The science of materials at the nanoscale provides a rich scholarly focus at the confluence of basic science (physics, chemistry, biology, and mathematics) and the engineering disciplines. An interdisciplinary focus provides undergraduates with a comprehensive view of the key materials science issues in nanoscience and nanotechnology.

Structural Materials. This area features the relationships among the chemical and physical structure of materials and their properties and performance. Regardless of the material class—year of graduate study—that provides a professional and understanding of the structure-property relationship of materials science issues in nanoscience and nanotechnology.

Undergraduate Program
Students must complete a minimum of 120 units, with which they must satisfy the UC Berkeley requirement requirements outlined in this catalog.

5 Year B.S./M.S. Program
The five-year combined Bachelor of Science/Master of Science program augments the existing four-year undergraduate program with a fifth year of graduate study that provides a professional and oriented component, preparing students for careers in engineering or engineering management within the business, government, and/or industrial sectors. In this program, students earn a bachelor’s degree and subsequently, a Master of Science degree under Plan II (without thesis) of the designated emphasis in nanoscale science and engineering. The five-year program emphasizes graduate study through an independent project coupled to coursework. The program is open to undergraduate materials science and engineering majors (both single or joint majors) only.

Graduate Programs
Qualified holders of the bachelor’s degree in fields such as materials science and engineering, ceramic engineering, metallurgy, physics, chemistry, and various fields in engineering who have all successfully undertake graduate study in materials science.

A combination of coursework and research normally leads to the M.S., M.Eng., and Ph.D. degrees, qualifying for a wide range of positions in industry, governmental organizations, or universities that entail research or advanced engineering in the production, development, and use of materials. The coursework includes a core program in materials science and engineering, along with additional courses that provide breadth. MSE students may elect to follow the designated emphasis in nanoscience and engineering, as described in the Education in Materials Science and Engineering Materials Department. MSE students may elect to follow the designated emphasis in nanoscience and engineering, as described in the Education in Materials Science and Engineering Materials Department.

Topics for graduate research include studies in biomaterials; electronic, magnetic and optical materials; structural materials; chemical and electrochemical materials science and engineering; and computational materials science and engineering. A wide variety of facilities is available for processing, including thin film deposition by Molecular Beam Epitaxy, Pulsed Laser Deposition, and other physical vapor deposition techniques. Techniques such as transmission and scanning electron microscopy, surface characterization, optical spectroscopies, electron paramagnetic resonance, electrical transport, micropore X-ray emission spectroscopy, differential thermal analysis, precision calorimetry, and cryogenic and high temperature mechanical testing are used for fundamental characterization of the structure and properties of materials. Joint facilities in Berkeley’s Microfabrication Laboratory, the Integrated Materials Laboratory, and Lawrence Berkeley National Laboratory, including the National Center for Electron Microscopy and the Advanced Light Source, can be used for graduate research.

Lower Division Courses
24. Freshman Seminar. (1) One hour of lecture/discussion per week. Must be taken on a pass/no pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminaries are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 20 freshmen. Staff

Upper Division Courses
102. Bonding, Crystallography, and Crystal Defects. (3) Three hours of lecture per week. Prerequisites: Engineering 45. Bonding in solids; classification of metals, semiconductors, and insulators; crystal systems; point, line, and planar defects in crystals; examples of crystalllographic and defect analysis in engineering materials; relationship to physical and mechanical properties. (F) Chrzan, Suzuki

103. Phase Transformations and Kinetics. (3) Three hours of lecture per week. Prerequisites: 102 and Engineering 115. The nature, mechanisms, and kinetics of phase transformations and microstructural changes in the solid state. Atom diffusion in solids. Phase transformations through the nucleation and growth of new matrix or precipitate phases. Martensitic transformations, spinodal decomposition. The use of phase transformations to control microstructure. (SP) Glaeser

110. Materials Characterization. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Physics 7A-7B or Physics 7A-7B and consent of instructor. Introduction to the physical principles underlying the electric properties of materials with emphasis on the measurement and control of defects and impurities through physical purification, bulk and thin film crystal growth and doping processes, materials basis of electronic and optoelectronic devices (diodes, transistors, semiconductor electronics, optical fibers; properties of metals and oxide superconductors and their applications. (SP) Dubon, Wu

117. Properties of Dielectric and Magnetic Materials. (3) Three hours of lecture per week. Prerequisites: Physics 7A-7B or Physics 7A-7B and consent of instructor. This course provides an introduction to the physical principles underlying the dielectric and magnetic properties of solids. Processing-microstructure-property relationships, materials selection for design, mechanical properties of polymers and design of plastic components, complex states of stress and strain, elastic deformation and multiaxial loading, plastic deformation and yield criteria, dislocation plasticity and strengthening mechanisms, creep, effects of stress concentrations, fracture, fatigue, and contact stresses. (F) Ritchie

120. Materials Production. (3) Three hours of lecture per week. Significance of materials. Occurrence of raw materials. Scientific and engineering principles relevant to materials production and processing. Methods for production of major materials. (F) Doyle

121. Metals Processing. (3) Three hours of lecture per week. Prerequisites: Engineering 45. The principles of metals processing with emphasis on the use of processes and procedures which impact desirable engineering properties. The techniques discussed include solidification, thermal and mechanical processing, powder processing, welding and joining, and surface treatments. (SP) Gronsky

122. Ceramic Processing. (3) Three hours of lecture per week. Prerequisites: Engineering 45. Powder fabrication by grinding and chemical methods, rheological behavior of powder-fluid suspensions, forming methods, drying, sintering, and grain growth. Reduction of processing steps to microstructure development. (F) Glasear

123. Semiconductor Processing. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 111 or Physics 7A-7B and consent of instructor. Semiconductor purification and crystal growth methods; impurity doping by diffusion, ion implantation and alloy regrowth; contact formation, mechanical and chemical processing; semiconductor analysis. (F) Wu

125. Thin-Film Materials Science. (3) Three hours of lecture per week. Prerequisites: Upper division or graduate standing in engineering, physics, chemistry, or mathematics. Physics 41A or Mathematics 105A required. Physics 111 or Physics 141A recommended. Deposition, processing, and characterization of thin films and their technological applications. Physical and chemical properties of various deposition methods. Thin-film neuron static and dynamic behavior. Thermal and ion processing. Microstructural development in epitaxial, polycrystalline, and amorphous films. Thin-film characterization techniques. Applications to information storage, integrated circuits, and optoelectronic devices. Laboratory demonstrations. (SP) Dubon

130. Experimental Materials Science and Design. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Senior standing or consent of instructor. This course provides a culminating experience for students approaching completion of the materials science and engineering curriculum. Laboratory experiments are undertaken in a variety of areas from the investigations on semiconductor materials to corrosion science and elucidate the relationships among structure, processing, properties, and performance. The principles of materials selection in engineering design are reviewed. Three hours of lecture per week. (F) Staff

140. Nanomaterials for Scientists and Engineers. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 102 or equivalent recommended; Physics 7C and Engineering 45 required. This course introduces the fundamental principles needed to understand the behavior of materials at the nanometer length scale and the different classes of nanomaterials and their applications ranging from information technology to biotechnology. Topics include introduction to different classes of nanomaterials; synthesis and characterization of nanomaterials; and the electronic, magnetic, and mechanical properties of nanomaterials. (SP) Minor

150. Introduction to Materials Chemistry. (3) Three hours of lecture per week. Prerequisites: Chemistry 104B is recommended. The application of basic chemical principles to problems in materials discovery, design, and processing of materials. Topics to be discussed may include inorganic solids, nanoscale materials, polymers, and biological materials, with specific focus on the ways in which atomic-level interactions dictate the bulk properties of matter. Also listed as Chemistry C150. (SP) Staff

151. Polymeric Materials. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A or Engineering 5, 103 is recommended. This course is designed for upper-division undergraduate and graduate students majoring in engineering and amorphous and semicrystalline polymeric materials. Beginning with a treatment of ideal polymer chain conformations, it develops the thermodynamics of polymer blends and solutions, the mechanics of amorphous polymers, and the dynamics of polymer chains, and the morphologies of thin films and other dimensionally-restricted structures relevant to nanotechnology. (SP) Xu

194. Honors Undergraduate Research. (1-4) Course may be repeated for credit. Variable format. Prerequisites: Consent of instructor. PAF 3.3 or higher and consent of instructor and adviser. Students who have completed a satisfactory number of advanced courses with a GPA of 3.3 or higher may pursue individual research projects under the supervision of the members of the staff. A maximum of 3 units of H194 may be used to fulfill Technical Elective requirements in the Materials Science and Engineering Program or double majors (unlike 199 or 198, which do not satisfy Technical Elective requirement). Final report required. (F,SP) Staff

195. Special Topics for Advanced Undergraduates. (1) One hour of directed group study per week. Prerequisites: Upper division standing and good academic standing. (2.0 GPA and above). Group study of special topics in nanotechnology. Selection of topics for further study of underlying concepts and relevant literature, in consultation with appropriate faculty members. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for a maximum of 4 units per semester. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and major adviser. Supervised independent study. Enrollment requirements apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP) Staff

200A. Survey of Materials Science. (4) Four hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. A survey of materials science at the beginning graduate level, intended for those who did not major in the field as undergraduates. Topics include the nature of materials, its manipulation and control to determine engineering properties. Reviews bonding, structure and microstructure, the chemical, electromagnetic and mechanical properties of materials, and introduces the student to microstructural engineering. (F) Asta

201A. Thermodynamics and Phase Transformations in Solids. (4) Four hours of lecture per week. Prerequisites: 102, 103, Engineering 115, or consent of instructor. 201A is prerequisite to 201B. The laws of thermodynamics, fundamental equations for multi-component elastic solids and electromagnetic media, equilibrium criteria. Application to solution thermodynamic and phase transformations. Phase transitions, Landau rule, symmetry rules. Interfaces, nucleation theory, elastic effects. Kinetics: diffusion of heat, mass and charge; coupled flows. (F,SP) Staff

202. Crystal Structure and Bonding. (3) Three hours of lecture per week. Regular, irregular arrays of points, tessellations of the plane, symmetry, lattices, direct, reciprocal; crystallographic point and space groups; atomic structure; bonding in molecules; bonding in solids; ionic (Pauling rules), covalent, metallic bonding; structure of elements, compounds, glasses, polymers. (F,SP) Cheung

204. Theory of Electron Microscopy and X-Ray Diffraction. (3) Three hours of lecture per week. Prerequisites: 102, 103, or equivalent. Basic principles of techniques used in the characterization of engineering materials by electron microscopy, diffraction, and spectroscopy; emphasis on detailed analysis of defects responsible for materials properties. Modern electrical, optical and particle beam techniques for characterization of bulk single crystals and their crystalline and amorphous state; defect structure in glass and deep level Transient Spectroscopy, IR-Spectroscopy. (F,SP) Gronsky

205. Defects in Solids. (3) Three hours of lecture per week. Prerequisites: Physics 7C or consent of instructor. Many properties of solid state materials are determined by lattice defects. This course treats in detail the structure of crystal defects, defect formation and annihilation processes, and the influence of lattice defects on the physical and optical properties of materials. (SP) Staff

211. Mechanics of Solids. (3) Students will receive no credit for 231A after taking Civil Engineering 231A or 231B prior to Fall 1992. Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Mechanical response of materials: Simple
213. Environmental Effects on Materials Properties and Behavior. (3) Three hours of lecture per week. Prerequisites: MSE 112 or equivalent. Review of electrochemical aspects of corrosion; pitting and crevice corrosion; active/passive transition; fracture mechanics approach to corrosion; stress corrosion cracking; hydrogen embrittlement; liquid metal embrittlement; corrosion fatigue; testing methods. (F) DeVine

C214. Micromechanics. (3) Three hours of lecture per week. Prerequisites: C211, Civil Engineering C231, or consent of instructor. Basic theories, analytical techniques, and mathematical foundations of micromechanics. It includes: (1) physical micromechanics, such as mathematical theory of dislocation, and cohesive fracture models; (2) micro-elasticty that includes Eshelby’s eigenstrain theory, comparison variational principles, and micro-continuum-covary based micromechanics theory; (3) thermomechanical composite materials that include the main methodologies in evaluating overall material properties; (4) meso-plasticity that includes meso-damage theory, and the crystal plasticity; and (5) homogenization theory of materials with periodic structures. Also listed as Civil and Environmental Engineering C236. (SP) Givendjee, Li

215. Computational Materials Science. (3) Two hours of lecture and three hours of computer laboratory per week. Prerequisites: C201, Engineering C201, or consent of instructor. Introduction to computational materials science. Development of atomic scale simulations for materials science applications. Application of kinetic Monte Carlo, molecular dynamics, and total energy techniques to the modeling of surface diffusion processes, elastic constants, ideal shear strengths, and defect properties. Introduction to numerical methods for solving coupled differential equations and for studying correlations. (F) Chzhan

C216. Macromolecular Science in Biotechnology and Medicine. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Bioengineering 111, or consent of instructor. Overview of the problems associated with the selection and function of polymers used in biotechnology and medicine. Principles of polymer science, polymer synthesis, and structure-property-performance relationships of polymers. Particular emphasis is placed on the performance of polymers in biological environments. Interactions between macromolecules and biological systems for therapy and diagnosis. Specific applications will include drug delivery, gene therapy, tissue engineering, and surface engineering. Also listed as Bioengineering C216. (SP) Healy

221. Fuel Cells, Batteries, and Chemical Sensors: Principles, Materials, and Technologies. (3) Three hours of lecture per week. Prerequisites: Engineering 115. We first consider the principles and electrode processes of electrochemical devices, chiefly fuel cells and batteries, and chemical sensors. Then we discuss various transport processes in liquid, polymeric, and solid electrolytes. AC and DC analytical methods are described. We discuss various fuel cell types, their potential for utility on a large scale, and the choices of materials. Finally, we discuss issues of fabrication systems. Time permitting, we may include some laboratory experiments. (SP) Staff

223. Semiconductor Materials. (3) Three hours of lecture per week. Prerequisites: Physics 7C or consent of instructor. Semiconductor purification and crystal growth; impurities and dopants; electronic, optical, and annealing. Metal-semiconductor interfaces and reactions. Interaction between defects and impurities during processing of devices. Major electronic and optical methods for the analysis of semiconductors. (F) Dubon, Wu

224. Magnetism and Magnetic Materials. (3) Three hours of lecture per week. Prerequisites: 111 or equivalent or consent of instructor; 117 recommended. This course covers the fundamentals of magnetism and magnetic materials, including applications in magnetic devices and sensors. Topics include magnetic moments in classical versus quantum mechanical pictures, diamagnetism, paramagnetism, magnetism of systems with short-range interactions, magnetic anisotropy, and magnetostriction. Magnetic materials covered include transition metals, their alloys and oxides, rare earths and their oxides, organic and molecular magnets. Throughout the course, experimental techniques in magnetic characterization will be discussed. The second part of the course will focus on particular magneto-technical materials and devices of technological interest (e.g., magnetoresistive and magneto-optical materials and devices). Additional topics include bio-magnetism and spin glasses. (F) Suzuki

C225. Thin-Film Science and Technology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or sciences, or consent of instructor. Thin-film nucleation and growth, microstructural evolution and reactions. Comparison of thin-film deposition techniques. Characterization techniques. Processing of thin films by ion implantation and rapid annealing. Processing-microstructure-property-performance relationships in the context of applications in information storage, ICs, microelectromechanical systems, and photovoltaics. Also listed as Applied Science and Technology C225. (SP) Wu

C226. Photovoltaic Materials: Modern Technologies in the Context of a Growing Renewable Energy Market. (3) Three hours of lecture per week. Prerequisites: Material Science and Engineering 111 or equivalent. Should have a firm foundation in electronic and optical props of semiconductors and basic semiconductor device physics. This technical course focuses on the fundamentals of photovoltaic materials and devices and the technological principals of operation and design of efficient semiconductor solar cell devices. This course is aimed at equipping students with the concepts and analytical skills necessary to assess the potential of various modern photovoltaic technologies in the context of a growing global renewable energy market. Also listed as Energy and Resources Group C226. (F) Kamm, Staff

241. Electron Microscopy Laboratory. (2) Six hours of laboratory per week. Prerequisites: 204 (can be taken concurrently). Basic techniques and operations of transmission, and scanning, electron microscopy; X-ray microanalysis, energy loss spectroscopy; specimen preparation, interpretation of data; individual projects in materials science. (SP) Gronsky, Minor

251. Polymer Surfaces and Interfaces. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A or Engineering 5; Material Science and Engineering 151 recommended. The course is designed for graduate students to gain a fundamental understanding of the surface and interfacial science of polymeric materials. Beginning with a brief introduction of the principles governing polymer phase behavior in bulk, it develops fundamental concepts in polymer physics in thin films and at interfaces, the characterization techniques to assess polymer behavior in thin films and at interfaces, and the morphologies of polymer thin films and other materials as relevant to nanotechnology and biotechnology. Field trips to national user facilities, laboratory demonstrations and hands-on experiments, and guest lectures will augment the courses lectures. (F) Xu

260. Surface Properties of Materials. (3) Three hours of lecture per week. Formerly Mineral Engineering 260. Thermodynamics of surfaces and phase boundaries, surface tension of solids and liquids, surface activity, adsorption, phase equilibria, and contact angles, electrochemical double layers at interfaces, theory, and applications. (SP) Salmeron

C261. Introduction to Nanoscience and Engineering. (3) Three hours of lecture per week. Prerequisites: Calculus BC, differential equations, linear algebra, or, engineering, consent of adviser or instructor. A three-module introduction to the fundamental topics of Nanoscience and Engineering (NSE) theory and practice which are important to national user facilities, laboratory demonstrations and hands-on experiments. Students must take this course to satisfy the NSE Designated Emphasis core requirement. Also listed as Bioengineering C280, Nanoscale Science and Engineering C201, and Physics C201. (F,SP) Gronsky, S.W. Lee, Wu

290A. Special Topics in Materials Science. (3) Three hours of lecture per week. Prerequisites: Gradate standing. Formerly C290M. Lectures and appropriate assignments on fundamental aspects of materials science and engineering. (SP) Staff

290M. Special Problems in Materials Science. (3) Three hours of lecture per week. Prerequisites: 201A-201B or consent of instructor. Selected topics in the behavior of microstructural, magnetic, electronic, or mechanical systems for both monotonic and cyclic loading. (SP) Moros

296A. Independent Research for Five-Year B.S./M.S. Program. (1-2) One to two hours of independent study per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Acceptance into Five-Year B.S./M.S. Program. Students are expected to formulate, develop, and initiate an independent research project under the supervision of a research advisor. This course will meet once at the beginning of the semester to outline the expectations of the course. Periodic meetings covering topics such as maintaining a lab notebook, effective oral communications, etc., will be scheduled. Students will be expected to keep a laboratory notebook outlining their progress during the semester. A progress report will be due at the end of the semester. Students are expected to complete an independent research project under the supervision of a research advisor initiated in Materials Science and Engineering 296A. Students will also be expected to give an oral presentation, describing their research project and progress toward their goals in front of their peers at the end of the semester. (F) Staff

296B. Independent Research for Five-Year B.S./M.S. Program. (1-2) One to two hours of independent study per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 296A. This is the second semester of a two-course sequence for those majors in the Five-Year B.S./M.S. Program. Students are expected to complete an independent research project under the supervision of a research advisor initiated in Materials Science and Engineering 296A. This course will meet once at the beginning of the semester to outline the expectations of the course. Periodic meetings covering topics such as data analysis and design of experiment will be scheduled. Students will be expected to keep a lab notebook outlining their progress during the semester. A final report in journal publication form will be due at the end of the semester. Each student will also give a final presentation on his/her research project at the end of the semester. (SP) Staff

298. Group Studies, Seminars, or Group Research. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Advanced study in various subjects through special seminars on topics to be selected each year, informal group
The Department of Mathematics offers a broad range of courses in mathematics and applied mathematics leading to the B.A. degree. These programs provide excellent preparation for advanced degrees in math, physical sciences, economics, and industrial engineering, as well as graduate study in business, education, law, and medicine. They also prepare students for post-baccalaureate positions in business, technology, industry, teaching, government, and finance. The requirements for both majors are summarized below. Visit the department website for more information at math.berkeley.edu/undergraduate.html.

Students should contact an undergraduate advisor in 964 or 965 Evans Hall about requirements for admission to the major.

General Major Requirements. Both major programs require a lower-division base of Mathemati- cals 1A-1B, 53, 54. A student in Math 16A-16B is not an acceptable alternative to Math 1A-1B. Math 1A-1B must be completed with an average grade of C or better; Math 53, 54, and 55 must be completed with minimum grades of C in each. Eight upper division courses are required for either major. Specific course requirements follow.

Major in Mathematics. Four core courses: 104, 110, 113 and 185; two semi-electives (select one course from each of the three subject areas): (1) Computing (128A), (2) Geometry (130, 140, 141, 142, 143), and (3) Logic and foun-dations (125A, 135, 136), and two upper-division math electives. With the approval of the major adviser, students may count two mathematically theoretical courses in computer science, statistics, physics, astronomy, mathematical economics, or other technical courses toward requirements for the major in mathematics.

Major in Mathematics with a Teaching Concentra-tion. The new teaching concentration is designed to increase the number and quality of math teachers. It requires the completion of the core math courses, Math 151, 152, and 153, and includes a modification to the typical major course sequence. Visit math.berkeley.edu for more information.

Major in Applied Mathematics. 104, 110, 113, 126A, 126B, 185, 54, 55, 56, 100, 108, 189. For an upper division courses, approved by a major adviser, which form a coherent cluster in some applied area such as actuarial science, classical mechanics, computer science, economics, fluid mechanics, geophysics, mathematical biology, numerical analysis, opera-tions research, probability theory, quantum mechanics, statistics, systems theory. Many other clusters are also possible.

Honors Program. In addition to completing the requirements for the major in mathematics or applied mathematics, students in the Honors Pro-gram must: (1) earn a GPA of at least 3.5 in upper division and graduate courses in the major and at least 3.65 in the major.

Assistant Professors
Per-Olof Persson, Ph.D. Massachusetts Institute of Technology. Application of scientific computing methods, computational fluid, solid mechanics.
John Wilkening, Ph.D. University of California, Berkeley. Applied mathematics, material science, scientific computing.
Lauren Williams, Ph.D. Massachusetts Institute of Technology. Combinatorics and its connections with representation theory and statistical physics.

Adjunct Professor
Yuxiao Peres, Ph.D. Hebrew University. Probability theory and Haudsoff dimension.

Affiliated Professor
Alan H. Schoenfeld, Ph.D. Stanford University. Psychology of problem solving (Education)

Professor-in-Residence
Gregory Barenblatt, Applied mechanics, mechanics of solids

The Major Programs
least 3.3 in all courses taken at the University; (2) complete either Math 196, in which they will write a senior honors thesis, or pass two graduate mathematics courses with a grade of at least A-; and (3) receive the recommendation of the head adviser. Students interested in the Honors Program should consult with an adviser early in their program, preferably by their junior year.

The Minor Program

Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field of academic and administrative distinct from their major. The minor program in the Department of Mathematics consists of the following coursework.

Prerequisites. Mathematics 1A-1B, 53, and 54 (or their equivalents). These courses must be taken for a letter grade and must be passed with average grades of C or better.

Minor Requirements. Mathematics 104, 110, 113, and 185, plus one additional upper-division mathematics course. These five courses must each be taken for a letter grade, and a minimum GPA of 2.0 is required in the upper division. This minor is not available to students who have been placed into Math 32. Precalculus. (4)

Students will receive no credit for Math 32 after taking Math 1B. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop per week. Prerequisites: 1A. Trigonometry, plus a satisfactory grade in 1A. Two hours of lecture and one hour of discussion/workshop per week. Prerequisites: 1A. Honors version of 1A. Techniques of integration; applications of integration. Infinite sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

H1B. Honors Calculus. (4) Students will receive 2 units of credit for H1B after taking 1B. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1A. Honors version of 1A. Techniques of integration; applications of integration. Infinite sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

16A. Analytic Geometry and Calculus. (5) Students will receive no credit for 16A after taking 1A. Two units of 16A may be used to remove a deficient grade in 1A. Two hours of lecture and one hour of discussion/workshop per week; at the discretion of the instructor, an additional one-half hour of lecture or discussion/workshop per week. Prerequisites: 1A. Three years of high school mathematics, including trigonometry, plus a satisfactory grade in one of the following: CEEB MAT Test, an AP Test, the UC/CSU Math Diagnostic Test, or 32. Consult the Department of Mathematics for details. Students with AP credit who consider themselves better advanced than 1A. This sequence is intended for majors in engineering and the physical sciences. An introduction to differential and integral calculus of functions of one variable; differentiation; introduction to transcendental functions. (F,SP)

1B. Calculus. (4) Students will receive 2 units of credit for 1B after taking 1B. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop per week. Prerequisites: 1A. Continuation of 1A. Techniques of integration; applications of integration. Infinite sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

Preparing for Graduate Study

Students preparing for the Ph.D. in mathematics are strongly advised to acquire a reading knowledge of one foreign language from among French, German, and Russian. Undergraduate students also often take one or more of the following introductory graduate courses: 20a20b, 214, 225a-225b, 250a-250b.

Graduate Programs

The department offers the M.A. degree in mathematics and Ph.D. degrees in mathematics and applied mathematics. Detailed information concerning admission, graduate student instructorships and fellowships, and degree requirements is given in the Graduate Announcement of the Department of Mathematics, available at math.berkeley.edu/graduate.html.

Courses and Seminars

Courses and seminars are listed below. More detailed and up-to-the-minute information on semester offerings, instructors, textbooks, course and seminar content, teaching and grading methods, and schedules are posted on the ninth floor of Evans Hall and are available at math.berkeley.edu.

Math 1A-1B is the calculus sequence intended for students planning majors in mathematics, engineering, or the sciences. The sequence is also acceptable as a substitute for Math 16A-16B. It is designed to prepare students for further courses in mathematics.

Math 16A-16B is a terminal calculus sequence intended for students planning majors in the life or social sciences.

Math 32 is intended for students who wish to take Math 1A or 16A but have not met the prerequisites.

Lower Division Courses

1A. Calculus. (4) Students will receive no credit for 1A after taking 16A and 2 units after taking 16A. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/laboratory per week. Prerequisites: Some units in lower-division mathematics class. Students with partial credit in lower-division calculus may, with consent of instructor, complete the credit under this heading. (F,SP)

1B. Calculus. (4) Students will receive 2 units of credit for 1B after taking 1B. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1A. Continuation of 1A. Techniques of integration; applications of integration. Infinite sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

Graduate Programs

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Lower Division Courses

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1B. Calculus. (4) Students will receive 2 units of credit for 1B after taking 1B. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1A. Continuation of 1A. Techniques of integration; applications of integration. Infinite sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

Examination. Polynomial and rational functions, exponential and logarithmic functions, trigonometry and trigonometric functions. Complex numbers, fundamen- tal theorem of algebra, binomial theorem, series, and sequences. (F,SP)

49. Supplementary Work in Lower Division Math- ematics. (1-3) Course may be repeated for credit. Meetings to be arranged. Prerequisites: Some units in a lower-division mathematics class. Students with partial credit in lower-division mathematics may, with consent of instructor, complete the credit under this heading. (F,SP)

53. Multivariable Calculus. (4) Students will receive 1 unit of credit for 53 after taking 50B and 3 units of credit after taking 50A. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1B. Parametric equations and polar coordinates. Vectors in 2- and 3-D Euclidean spaces. Partial derivatives. Multiple integrals. Vector calculus. Theorems of Green, Gauss, and Stokes. (F,SP)

H53. Honors Multivariable Calculus. (4) Students will receive 1 unit of credit for H53 after taking 50B and 3 units after taking 50A. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1B. Honors version of 1B. Techniques of integration; applications of integration. Integral sequences and series. First-order ordinary differential equations. Second-order ordinary differential equations and series; oscillation and damping; series solutions of ordinary differential equations. (F,SP)

54. Linear Algebra and Differential Equations. (4) Students will receive 1 unit of credit for 54 after taking 50A. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1B. Basic linear algebra; matrix arithmetic and determinants. Vector spaces; inner product spaces. Eigenvalues and eigenvectors; linear transformations. Homogeneous ordinary differential equations; first-order ordinary differential equations with constant coefficients. Fourier series and partial differential equations. (F,SP)

H54. Honors Linear Algebra and Differential Equa- tions. (4) Students will receive 1 unit for H54 after taking 50A. Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: 1B. Honors version of 1B. Basic linear algebra; matrix arithmetic and determinants. Vectors spaces; inner product spaces. Eigenvalues and eigenvectors; linear transformations. Homogeneous ordinary differential equations; first-order ordinary differential equations with constant coefficients. Fourier series and partial differential equations. (F,SP)

55. Discrete Mathematics. (4) Students will receive no credit for 55 after taking Computer Science 70. Three hours of lecture and two hours of discus- sion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week. Prerequisites: Math- ematical maturity appropriate to a sophomore math class. A-1B recommended. Set induction sets, relations, and functions. Introduction to graphs, elementary number theory, combina- torics, algebraic structures, and discrete probability theory. (F,SP)

74. Transition to Upper Division Mathematics. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: 53 and 54. The course will focus on reading and understanding mathematical proofs. It will emphasize precise thinking and the pre- sentation of mathematical results, both in written and in written form. The course is intended for students who are considering majors in mathematics but wish additional training. (F,SP)

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of semi-
nar per week per unit for 15 weeks. One and one-half hours of seminar per week per unit for 10 weeks. Three hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for seven weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Some sections may require more advanced practice. Interactive seminars offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

H90. Honors Undergraduate Seminar in Mathematical Problem Solving. (1) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor; undergraduate standing. This seminar is designed especially, but not exclusively, to prepare students for the annual National Putnam Mathematical Competition in December. Students will develop problem solving skills and experience by attempting the solution of challenging mathematical problems that require insight more than knowledge. (F)

91. Special Topics in Mathematics. (4) Course may be repeated for credit. Three hours of lecture/consecution per week. Topics to be covered and the method of instruction to be used will be announced at the beginning of each semester that such courses are offered. (F,SP) Staff

98. Supervised Group Study. (1-4) Must be taken on a passed/not passed basis. Directed group study, topics vary with instructor. (F,SP)

99. Supervised Independent Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the introduction to Courses and Curricula section of this catalog. Independent study, weekly meeting with faculty. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sophomores only. Consent of instructor. Supervised independent study by academically superior, lower division students. 3.3 GPA required and prior consent of instructor who is to supervise the study. A written proposal must be submitted to the department chair for pre-approval. (F,SP) Staff

Upper Division Courses

C103. Introduction to Mathematical Economics. (4) Three hours of lecture per week; one hour per week per unit for five sections illustrating the application of mathematics to economic theory. This course is intended for upper division students in mathematics, statistics, the physical sciences, and engineering, and for economics majors with adequate mathematical background. No economic background is required. Also listed as Economics C103. Staff

104. Introduction to Analysis. (4) Three hours of lecture per week; at the discretion of the instructor, an additional hour of discussion per week. Prerequisites: 53 and 54. The real number system, sequences, limits, and continuous functions in R and R^n. The concept of a metric space. Uniform convergence, interchange of limit operations. Infinite series. Mean value theorem and applications. The Riemann integral. (F,SP) Staff

H104. Honors Introduction to Analysis. (4) Three hours of lecture per week. Prerequisites: S3 and 54. Honors section corresponding to 104. Recommended for honors seminars areargar students who excel and are good at it. Greater emphasis on theory and challenging problems.

105. Second Course in Analysis. (4) Three hours of lecture per week. Prerequisites: 104. Differential calculus in R^n, the derivative as a linear map; the chain rule and implicit function theorem; Lebesgue integration on the line; comparison of Lebesgue and Riemann integrals. Convergence theorems. Fourier series, L^2 theory. Fubini’s theorem, change of variable. (SP)

110. Linear Algebra. (4) No credit allowed after completion of Math 112 or 113B. Three hours of lecture per week and an additional two hours of discussion at the discretion of the instructor. Prerequisites: 54 or a course with equivalent linear algebra content. Matrices, vector spaces, linear transformations, inner products, determinants. Eigenvectors. QR factorization. Jordan canonical forms and Rayleigh’s principle. Fubini’s theorem, change of variable. (SP) Staff

H110. Honors Linear Algebra. (4) No credit allowed after completion of Math 112 or 113B. Three hours of lecture per week. Prerequisites: 54 or a course with equivalent linear algebra content. Honors section corresponding to course 110 for exceptional students with strong mathematical inclination and motivation. Emphasis is on rigor, depth, and hard problems. (SP)

113. Introduction to Abstract Algebra. (4) Three hours of lecture per week; at the discretion of the instructor, an additional two hours of discussion per week. Prerequisites: 54 or a course with equivalent linear algebra content. Sets and relations. The integers, congruences, and the Fundamental Theorem of Arithmetic. Groups and their factor groups. Commutative rings, ideals, and quotient fields. The theory of polynomials: Euclidean algorithm and unique factorizations. The Fundamental Theorem of Algebra. Fields and field extensions. (F,SP) Staff

H113. Honors Introduction to Abstract Algebra. (4) Three hours of lecture per week. Prerequisites: 54 or a course with equivalent linear algebra content. Honors section corresponding to 113. Recommended for students who enjoy mathematics and are good at it. Greater emphasis on theory and challenging problems. (F)

114. Second Course in Abstract Algebra. (4) Three hours of lecture per week. Prerequisites: 110 and 113, or consent of instructor. Further topics on groups, rings, and fields not covered in Math 113. Possible topics include the Sylow Theorems and their applications to group theory; classical groups; abelian groups and modules over a principal ideal domain; algebraic field extensions; splitting fields and Galois theory; construction and classification of finite fields. (SP) Staff

115. Introduction to Number Theory. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Divisibility, congruences, numerical functions, theory of primes. Topics selected: Diophantine analysis, continued fractions, partitions, quadratic fields, asymptotic distributions, additive problems. (F,SP)

116. Cryptography. (4) Three hours of lecture per week. Prerequisites: 55. Construction and analysis of simple cryptosystems, public key cryptography, RSA, signature schemes, key distribution, hash functions, elliptic curves, and applications. (F,SP)

118. Fourier Analysis, Wavelets, and Signal Processing. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Introduction to signal processing including Fourier analysis and wavelets. Theory, algorithms, and applications to one-dimensional signals and multidimensional images. (F,SP)

121A. Mathematical Tools for the Physical Sciences. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Intended for students in the physical sciences who are not planning to take more advanced mathematics courses. Rapid review of material per week. Techniques of polynomial, power series, special functions, series solutions of ordinary differential equations, partial differential equations arising in mathematical physics, probability theory, and discrete probability theory. (SP)

121B. Mathematical Tools for the Physical Sciences. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Intended for students in the physical sciences who are not planning to take more advanced mathematics courses. Special functions, series solutions of ordinary differential equations, partial differential equations arising in mathematical physics, probability theory, and discrete probability theory. (SP)

123. Ordinary Differential Equations. (4) Three hours of lecture per week. Prerequisites: 104. Existence and uniqueness of solutions, linear systems, stability of equilibria, critical points. Other topics selected from analytical systems, autonomous systems, Sturm-Liouville Theory. (F)

125A. Mathematical Logic. (4) Three hours of lecture per week. Prerequisites: 113 or consent of instructor. Sentential and quantificational logic. Formal grammars, semantical interpretation, and their interrelation. Applications to formalized mathematical theories. Selected topics from model theory or proof theory. (F,SP)

126. Introduction to Partial Differential Equations. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Waves and diffusion, initial value problems for hyperbolic and parabolic equations, boundary value problems for elliptic equations, Green’s functions, maximum principles, a priori bounds, Fourier transform. (SP)

127. Mathematical and Computational Methods in Molecular Biology. (4) Three hours of lecture per week. Prerequisites: 53, 54, and 55; Statistics 20 recommended. Introduction to mathematical and computational problems arising in the context of molecular biology. Theory and applications of combinatorics, probability, statistics, geometry, and topology to problems ranging from sequence determination to structure analysis. (F,SP)

128A. Numerical Analysis. (4) Three hours of lecture and one hour of discussion per week. At the discretion of the instructor, an additional hour of discussion/computer laboratory per week. Prerequisites: 53 and 54. Programming for numerical calculations, round-off error, approximation and interpolation, numerical quadrature, and solution of ordinary differential equations. Practice on the computer. (F,SP)

128B. Numerical Analysis. (4) Three hours of lecture and one hour of discussion per week. At the discretion of the instructor, an additional hour of discussion/computer laboratory per week. Prerequisites: 110 and 128A. Iterative solution of systems of nonlinear equations, evaluation of eigenvalues and eigenvectors of matrices, applications to simple partial differential equations. Practice on the computer. (F,SP)

130. The Classical Geometries. (4) Three hours of lecture per week. Prerequisites: 110 and 113. A critical examination of Euclid’s Elements; ruler and compass constructions; connections with Galois theory; non-Euclidean geometry; hyperbolic geometry; the arithmetic of quadratic fields and fields and field extensions. (F,SP)


136. Incidence and Uncidibility. (4) Three hours of lecture per week. Prerequisites: 53, 54, and 55. Functions computable by algorithm, Turing machines, Church’s thesis. Unsolvability of the halting problem, Rice’s theorem. Recursively enumerable sets, creative sets, many-one reductions. Self-referential programs. Godel’s incompleteness theorems, undecidability of validity, decidable and undecidable theories. (F,SP)

140. Metric Differential Geometry. (4) Three hours of lecture per week. Prerequisites: 104. Frenet frame, normal and geodesic curvatures, normal and geodesic curvature, geodesics, parallelism, the Gauss-Bonnet-Dyck Theorem. (F,SP)

141. Elementary Differential Topology. (4) Three hours of lecture per week. Prerequisites: 104 or equivalent and linear algebra. Manifolds in n-dimensional Euclidean space and smooth maps, Sard’s Theorem, W prefix=online course *Professor of the Graduate School †Recipient of Distinguished Teaching Award
142. Elementary Algebraic Topology. (4) Three hours of lecture per week. Prerequisites: 104 and 113. The topology of 1- and 2-D spaces: manifolds and triangulations, classification of surfaces, Euler characteristic, fundamental groups, plus further topics at the discretion of the instructor. (F)

143. Elementary Algebraic Geometry. (4) Three hours of lecture per week. Prerequisites: 113. Introduction to basic commutative algebra, algebraic geometry, and computational techniques. Main focus on curves, surfaces and Grassmannian varieties. (F,SP)

151. Mathematics of the Secondary School Curriculum I. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisites: 1A-1B, 53, or equivalent. Theory of rational numbers based on the number line, the Euclidean algorithm and fractions in lowest terms. The concepts of congruence and similarity, equation of a line, functions, and quadratic equations. (F,SP) Staff

152. Mathematics of the Secondary School Curriculum II. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisites: 151; 54, 113, or equivalent. Complex numbers and Fundamental Theorem of Algebra, roots and factorizations of polynomials, Euclidean vector and axiomatic systems, basic trigonometry. (F,SP) Staff

153. Mathematics of the Secondary School Curriculum III. (4) Three hours of lecture and zero to one hour of discussion per week. Prerequisites: 151, 152. History of mathematics. (4)

160. History of Mathematics. (4) Three hours of lecture per week. Prerequisites: 53, 54, and 113. History of algebra, geometry, analytic geometry, and calculus from ancient times through the 17th century and selected topics from more recent mathematical history. (SP)

170. Mathematical Methods for Optimization. (4) Three hours of lecture per week. Prerequisites: 53 and 54. Linear programming and a selection of topics from among the following: matrix games, integer programming, semidefinite programming, nonlinear programming, convex analysis and geometry, polyhedral geometry, the calculus of variations, and control theory. (F,SP) Staff

172. Combinatorics. (4) Three hours of lecture per week. Prerequisites: 55. Basic combinatorial principles, graphs, partially ordered sets, generating functions, asymptotic methods, combinatorics of permutations and combinations, sieve methods and codes. Additional topics at the discretion of the instructor. (F,SP) Staff

185. Introduction to Complex Analysis. (4) Three hours of lecture per week; at the discretion of the instructor, an additional two hours of discussion per week. Prerequisites: 104. Analytic functions of a complex variable. Cauchy’s integral theorem, power series, Laurent series, singularities of analytic functions, the residue theorem with application to definite integrals. Some additional topics such as conformal mapping. (F,SP) Staff


208. C*-algebras. (4) Three hours of lecture per week. Prerequisites: 206. Basic theory of C*-algebras. Positivity, spectrum, GNS construction. Group C*-algebras and connection with group representations. Additional topics, for example, C*-dynamical systems, K-theory.

209. Von Neumann Algebras. (3) Three hours of lecture per week. Prerequisites: 206. Basic theory of von Neumann algebras. Density theorems, topologies and normal maps, traces, comparison of projections, type classification, examples of factors. Additional topics, for example, Tomita Takasaki theory, subfactors, group actions, and noncommutative probability.

212. Several Complex Variables. (4) Three hours of lecture per week. Prerequisites: 185 and 202A-202B. Holomorphic functions of several complex variables. Complex manifolds. Introduction to the theory of domains of holomorphy, Hartogs’ phenomenon, pseudo convexity and plurisubharmonicity. The remainder of the course may treat either sheaf cohomology and Stein manifolds, or the theory of analytic subvarieties and spaces.


215A-215B. Algebraic Topology. (4) Three hours of lecture per week. Prerequisites: 185 and 202A-202B. Differential forms, vector fields, de Rham cohomology, singular homology, homotopy theory, fibrations, and applications. (F,SP) Staff

C18A. Probability Theory. (4) Three hours of lecture per week. Some knowledge of real analysis and metric spaces, including compactness. Knowledge of Lebesgue integral and/or elementary probability is helpful but not essential, given other strong mathematical background. Measure theory concepts needed for probability. Expectation, distributions. Laws of large numbers and central limit theorems for independent random variables. Characteristic function methods. Conditional expectations, characteristic functions. Markov chains. Stationary processes. Also listed as Statistics C205A. Staff

C18B. Probability Theory. (4) Three hours of lecture per week. Some knowledge of real analysis and metric spaces, including compactness. Knowledge of Lebesgue integral and/or elementary probability is helpful but not essential, given other-
219. Dynamical Systems. (6) Three hours of lecture per week. Prerequisites: 214. Differentiophisms on manifolds. Ergodic theory. Stable manifold, generic properties, structural stability. Additional topics selected by the instructor. (F)

220. Introduction to Probabilistic Methods in Mathematics. (3) Three hours of lecture per week. Prerequisites: Some familiarity with differential equations and their applications. Brownian motion, Langevin and Fokker-Planck equations, path integrals and Feynman diagrams, time series, an introduction to statistical mechanics, Monte Carlo methods, selected applications. (F,SP)

221. Advanced Matrix Computations. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. Direct solution of linear systems, including large sparse systems: error bounds, iteration methods, least square approximation, eigenvalues and eigenvectors of matrices, nonlinear equations, and minimization of functions. (F,SP)

222A. Partial Differential Equations. (4) Three hours of lecture per week. Prerequisites: 105 or 202A. The theory of boundary value and initial value problems for partial differential equations, with emphasis on nonlinear equations. Laplace’s equation, heat equation, wave equation, nonlinear first-order equations, conservation laws, Hamilton-Jacobi equations, Fourier transform, Sobolev spaces. (F)

222B. Partial Differential Equations. (4) Three hours of lecture per week. Prerequisites: 105 or 202A. The theory of boundary value and initial value problems for partial differential equations, with emphasis on nonlinear equations. Second-order elliptic equations, parabolic and hyperbolic equations, calculus of variations methods, additional topics selected by instructor. (F)

223A. Stochastic Processes. (3) Course may be repeated for credit with a different instructor. Three hours of lecture per week. The content of this course changes from year to year. Course topics will be selected from the general theory of processes, sample functions, Markov processes, martingales, Gaussian processes, and further topics. Also listed as Statistics C220A. (F,SP) Staff

223B. Stochastic Processes. (3) Course may be repeated for credit with a different instructor. Three hours of lecture per week. The content of this course changes from year to year. Course topics will be selected from the general theory of processes, sample function properties, weak convergence, Brownian motion, diffusion, Levy processes, Markov processes, martingales, Gaussian processes, and further topics. Also listed as Statistics C220B. (F,SP) Staff

224A-224B. Mathematical Methods for the Physical Sciences. (4,4) Three hours of lecture per week. Prerequisites: Graduate status or consent of instructor. Introduction to the theory of distributions. Fourier and Laplace transforms. Partial differential equations. Green’s function. Operator theory, with applications to eigenfunction expansions, perturbation theory, scattering and boundary value problems. Second-order elliptic equations, parabolic and hyperbolic equations, calculus of variations methods, additional topics selected by instructor. (F,SP Staff)


236. Metamathematics of the Set Theory. (4) Three hours of lecture per week. Prerequisites: 225B and 235A. Various set theories: comparison of strength, transitive, and natural models, finite axiomatizability. Independence and consistency of axiom of choice, continuum hypothesis, etc. The measure problem and axioms of strong infinity.

240. Riemannian Geometry. (4) Three hours of lecture per week. Prerequisites: 214. Riemannian metric and Levi-Civita connection, geodesics and completeness, geodesic connectedness, exponential map, geodesic variational problems of arbitrary length. Additional topics such as the theorems of Myers, Synge, and Cartan-Hadamard, the second fundamental form, convexity and rigidity of hypersurfaces in Euclidean space, homogeneous manifolds, the Weil-Bonnet theorem, and characteristic classes. (SP)

241. Complex Manifolds. (4) Three hours of lecture per week. Prerequisites: 214 and 215A. Riemann surfaces, divisors and line bundles on Riemann surfaces, sheaves and the Dolbeault theorem on Riemann surfaces, the classical Riemann-Roch theorem, the theorem of Abel-Jacobi. Complex manifolds, Kahler metrics. Summary of Hodge theory, groups of line bundles, additional topics such as the Kodaira-Spencer deformation theorem, Lefschetz hyperplane theorem. (SP)

242. Symplectic Geometry. (4) Three hours of lecture per week. Prerequisites: 214. Basic topics: symplectic linear algebra, symplectic manifolds, Darboux theorem, cotangent bundles, variational problems and Lagrangian submanifolds, Hamiltonian systems, Lagrangian transformations, Poisson submanifolds, Poisson brackets, symmetry groups and momentum mappings, coadjoint orbits, Kahler manifolds. (F,SP)

245A. General Theory of Algebraic Structures. (4) Three hours of lecture per week. Prerequisites: 113 and 114. Groups, rings, and fields. Homomorphisms, quotient structures and their isomorphisms. Classes of structures determined by identities. Constructions such as free objects, objects presented by generators and relations, ultraproducts, direct limits. Applications of general results to groups, rings, lattices, etc. Course may emphasize study of congruence-and subalgebra-lattices, or category-theory and adjoint functors, or other aspects.

249. Algorithmic Combinatorics. (4) Three hours of lecture per week. Prerequisites: 250A or consent of instructor. (1) Enumerations and exponential structures; (2) Posets and lattices; (3) Geometric combinatorics; (4) Symmetric functions, Young tableaux, and connections with representation theory. Further study of applications of the core material and/or additional topics, chosen by instructor. (F,SP Staff)

250A. Groups, Rings, and Fields. (4) Three hours of lecture per week. Prerequisites: 114 or consent of instructor. Group theory, Sylow theorems, the Atiyah-Hirzebruch theorem and the Sylow theorems. Basic theory of rings and their ideals. Unique factorization domains and principal ideal domains. Modules. Chain conditions. Fields, including fundamental theorem of Galois theory, theory of finite fields, and transcendence degree. (F)

250B. Multilinear Algebra and Further Topics. (4) Three hours of lecture per week. Prerequisites: 250A. Tensor algebras and exterior algebras, with applications to determinants and to Lie algebras. Exterior algebra, localization. Elementary specialization and valuation theory. Related topics in algebra. (SP)

251. Ring Theory. (4) Three hours of lecture per week. Prerequisites: 250A. Topics such as Noether rings, rings with descending chain condition, chain conditions and homomorphisms, and the Jacobson radical, hereditary rings. (F)

252. Representation Theory. (4) Three hours of lecture per week. Prerequisites: 250A. Structure of finite dimensional algebras, applications to representations of finite groups, the classical linear groups. (F)

253. Homological Algebra. (4) Three hours of lecture per week. Prerequisites: 250A. Modules over a ring, homomorphisms and tensor products of modules, free modules, and free objects, derived functors and derived functors, homological dimension of rings and modules. (SP)

254A-254B. Number Theory. (4,4) Three hours of lecture per week. Prerequisites for 254A: 245A for 254B. Evaluations, units, and ideals in number fields, ramification theory, quadratic and cyclotomic fields, topics from class field theory, zeta-functions and L-series, distribution of primes, modular forms, quadratic forms, cyclotomic fields, zeta functions and L-series, class groups and related topics, transcendental numbers. Sequence begins fall.

255. Algebraic Curves. (4) Three hours of lecture per week. Prerequisites: 250A-254B or consent of instructor. Elliptic curves. Algebraic curves, Riemann surfaces, and function fields. Singularities of Riemann-Roch theorem, Hurwitz embeddings and the canonical curve. Zeta functions of curves over finite fields. Additional topics such as Jacobians or the Riemann hypothesis. (F,SP)

256A-256B. Algebraic Geometry. (4,4) Three hours of lecture per week. Prerequisites: 250A-254B or consent of instructor. Linear algebraic varieties, affine and projective algebraic varieties. Theory of schemes and morphisms of schemes. Smoothness and differentials in algebraic geometry. Cohomology of sheaves and their cohomology. Riemann-Roch theorem and selected applications. Sequence begins fall.

257. Group Theory. (4) Three hours of lecture per week. Prerequisites: 250A. Topics such as generators and relations, infinite discrete groups, groups of Lie type, representation theory, solvable groups, simple groups, transfer and cohomological methods.

258. Classical Harmonic Analysis. (4) Three hours of lecture per week. Prerequisites: 206 or a basic knowledge of real, complex, and linear analysis. Basic Lie groups, the Fourier series and transforms, convergence and summability, conjugate functions, Hardy spaces, boundary behavior of analytic and harmonic functions. Additional topics at the discretion of the instructor. (F)

261A-261B. Lie Groups. (4,4) Three hours of lecture per week. Prerequisites: 214. Lie groups and Lie prefixes=language course for business majors
prefixes=honors course
algebras, fundamental theorems of Lie, general struc-
ture theory; compact, nilpotent, solvable, semi-simple
Lie groups; classification theory and representation
theory of Lie algebras and Lie groups; further topics
such as symmetric spaces, Lie transforma-
groups, etc., if time permits. In view of its
simplicity and its wide range of applications, it is prefer-
able to cover topics in their own represen-
tations in 261A. Sequence begins fall.

265. Differential Topology. (4) Three hours of lecture
per week. Prerequisites: 214 plus 215A or some famil-
liarity with algebraic topology. Approximations, degrees
of maps, vector bundles, tubular neighborhoods. Intro-
duction to Morse theory, stratified manifolds, cobordism.
Additional topics selected by instructor: charac-
teristic classes, classification of manifolds, immersions,
eMBEDDINGS, singularities of maps.

270. Hot Topics Course in Mathematics. (2) Course
may be repeated for credit as topic varies. One and
one-half hours of lecture per week. Must be taken on
a satisfactory/unsatisfactory basis. This course will
give introductions to current research developments.
Every semester we will pick a different topic and go
through the relevant literature. Each student will be
expected to give one presentation. (F,SP) Staff

271. Topics in Foundations. (4) Course may be
repeated for credit. Three hours of lecture per week.
Prerequisites: Consent of instructor. Advanced topics
chosen by the instructor. The content of this course
changes, as in the case of seminars.

273. Topics in Numerical Analysis. Three hours of
lecture per week. Prerequisites: Consent of instruc-
tor. Advanced topics chosen by the instructor. The
content of this course changes, as in the case of seminars.

275. Topics in Applied Mathematics. (4) Course
may be repeated for credit. Three hours of lecture per
week. Prerequisites: Consent of instructor. Advanced
topics chosen by the instructor. The content of this
course changes, as in the case of seminars.

276. Topics in Topology. (4) Course may be
repeated for credit. Three hours of lecture per week.
Prerequisites: Consent of instructor. Advanced topics
chosen by the instructor. The content of this course
changes, as in the case of seminars.

277. Topics in Differential Geometry. (4) Course
may be repeated for credit. Three hours of lecture per
week. Prerequisites: Consent of instructor. Advanced
topics chosen by the instructor. The content of this
course changes, as in the case of seminars.

278. Topics in Analysis. (4) Course may be repeated
for credit. Three hours of lecture per week. Prerequi-
sites: Consent of instructor. Advanced topics chosen
by the instructor. The content of this course changes,
as in the case of seminars.

279. Topics in Partial Differential Equations. (4)
Course may be repeated for credit. Three hours of
lecture per week. Prerequisites: Consent of instruc-
tor. Advanced topics chosen by the instructor. The
content of this course changes, as in the case of seminars.

280. Seminars. (1-6) Course may be repeated
for credit. Hours to be arranged. Topics in foundations
of mathematics, theory of numbers, numerical cal-
culations, analysis, geometry, topology, algebra,
and their applications, by means of lectures and infor-
mal conferences; work based largely on original
memos. (F,SP)

C290C. Topics in Fluid Mechanics. (1,2) Course
may be repeated for credit. One hour of seminar per
week. Must be taken on a satisfactory/unsatisfactory
basis. A study of important, contemporary problems.
Prerequisites: Consent of instructor. Lectures on
special topics which will be announced at the begin-
ing of each semester that the course is offered.
Topics may include transport and mixing, geophysical
fluid dynamics, biofluid dynamics, oceanography, free
surface flows, non-Newtonian fluid mechanics, among
other possibilities. Also listed as Environ Sci, Policy,
and Management C291, Physics C2910, Chemical
Engineering C291M, Civil and Environmental Engi-
nering C290K, Mechanical Engineering C298A, and
Bioengineering C290C. (F,SP) Staff

295. Individual Research. (1-12) Course may be
repeated for credit. Hours to be arranged. Sections
1-30 to be graded on a letter-grade basis. Sec-
tions 31-60 to be graded on a satisfactory/unsat-
factory basis. Intended for candidates for the Ph.D.
degree. (F,SP)

299. Reading Course for Graduate Students. (1-
6) Course may be repeated for credit. Hours to be
arranged. Sections 1-30 to be graded on a letter-grade
basis. Sections 31-60 to be graded on a satisfac-
tory/unsatisfactory basis. Investigation of special
problems under the direction of members of the
department. (F,SP)

600. Individual Study for Master’s Students. (1-
6) Course may be repeated for credit. Course does not
satisfy unit or residence requirements for master’s
degree. Hours to be arranged. Must be taken on
a satisfactory/unsatisfactory basis. Prerequisites:
For candidates for master’s degree. Individual study
for the comprehensive or language requirements in con-
sultation with the field advisor. (F,SP)

602. Individual Study for Doctoral Students. (1-
8) Course may be repeated for credit. Must be taken
on a satisfactory/unsatisfactory basis. Prerequisites:
For qualified graduate students. Individual study in
consultation with the major field advisor intended to
provide opportunities for qualified students to prepare
themselves for the various examinations required
for candidates for the Ph.D. Course does not satisfy
unit or residence requirements for doctoral degree.
(F,SP) Staff

Professional Courses

300. Teaching Workshop. (4) Two hours of lecture
per week, plus class visits. Must be taken on a satis-
factory/unsatisfactory basis. Prerequisites: 300, grad-
uate standing, recommendation as a graduate student
instructor. Mandatory for all graduate student instruc-
tors teaching for the first time in the Department of
Mathematics. The course consists of practice teaching,
postmortem discussions with one another, individual
review of field, and self-analysis of videotapes, reciproc-
al classroom visitations, and an individual project. (F,SP)

301. Undergraduate Mathematics Instruction. (1-2)
Course may be repeated once for credit. Three hours
of seminar and four hours of tutorial per week. Must be
taken on a pass/no pass basis. Prerequisites: Permission
of SLC instructor, as well as sophomore standing and at
least a B average in two semesters of calculus.
Apply at Student Learning Center. May be taken on
one unit by special permission of instructor. Tutoring at
the Student Learning Center or for the Professional Development Program. (F,SP)

303. Professional Preparation: Supervised Teach-
ing of Mathematics. (2-4) Course may be repeated
time for times for four formal meetings. Must be
taken on a satisfactory/unsatisfactory basis. Prereq-
sites: 300, graduate standing and appointment as a
graduate student instructor. Meeting with supervis-
ing faculty and with discussion sections. Experience
in classroom teaching under the supervision of Mathematics fac-
culty. (F,SP) Staff

Mechanical Engineering

(Dean of College of Engineering)

Department Office: 6195 Etchegary Hall, (510) 642-1338
Chair: David A. Dornfeld, Ph.D.

Professors

Alice M. Agogino (The Roscoe and Elizabeth Hughes Chair in Mechanical Engineering, Ph.D. Stanford University. Department and external appointments)

Van P. Carey (The A. Richard Newton Chair, Ph.D. State University of New York, Buffalo. Turbulence and multiphase systems, thermophysics of phase-change processes)

James Casey, Ph.D. University of California, Berkeley. Continuum mechanics

Jui-Yuan Chen, Ph.D. Cornell University. Turbine combustion, chemical kinetics, laser diagnostics

Hari Dharan, Ph.D. University of California, Berkeley. Composite materials

Robert W. Dibble, Ph.D. University of Wisconsin. Combustion, gas dynamics

David A. Dornfeld, Chair, Mechanical Engineering; The Will C. Holm Family Chair in Engineering, Ph.D. University of Wisconsin. Manufacturing processes, robotics

Carlos Fernandez-Pello (Associate Dean, Graduate Division; The Amy C. Maynard and Agnes Offayd Endowed Chair), Ph.D. University of California, San Diego. Combustion, heavy and condensed fuels

Michael L. Frankel, Ph.D. Hebrew University. Chemical kinetics, combustion chemistry, chemical vapor deposition

Costas Leondes, Ph.D. California Institute of Technology. Heat transfer, laser materials processing

J. Karl Hedrick, (The James Michael Wells Chair in Mechanical Engineering), Ph.D. Stanford University. Control systems, transportation systems

Roberto Horowitz (The James Michael Wells Chair), Ph.D. University of California, Berkeley. Automatic control systems design, robotics

George C. Johnson, Ph.D. Stanford University. Ultrasonic instrumentation

Homayoon Kazerooni, D.Sc. Massachusetts Institute of Technology, Mechanical Engineering

Tony Keaveny, Ph.D. Cornell University. Tissue engineering and biomechanics

Kynanom Konvoulos, Ph.D. Massachusetts Institute of Technology. Tribology, contact mechanics, mechanical behavior of materials

Dorian Liepmann, Ph.D. University of California, San Diego. Classical fluid dynamics, biofluid dynamics, wave motion


Liew Lin (The Chancellor’s Professor), Ph.D. University of California, Berkeley. NSF-CAREER MEMS (microelectromechanical systems)

Fai Ma, Ph.D. California Institute of Technology. Vibration and acoustics

Alaa Mansour, Ph.D. University of California, Berkeley. Structural reliability and safety, probabilistic dynamics of marine structures, strength of slip and offshore structures, development of design criteria

Philip Marcus, Ph.D. Princeton University. Computational fluid dynamics

Stephen Mao, Ph.D. Johns Hopkins University. Geophysical fluid dynamics

Oliver J. O’Reilly (Visiting Chair, Graduate Study), Ph.D. Cornell University. Nonlinear dynamics with applications to continuum mechanics

Andre Drackart, Ph.D. University of California, Berkeley. Automatic control systems, mechanical systems

Panagiotis Papadopoulos, Ph.D. University of California, Berkeley. Computational mechanics, solid mechanics

Albert P. Pisano (The FUNAC Chair for Mechanical Systems), Ph.D. Columbia University. Computer-aided design, design optimization

Kameshwar Poolla (The Cadence Distinguished Professorship in the College of Engineering), Ph.D. University of Florida, Gainesville. Dynamic systems, automatic controls

Lisa A. Pruitt (The Lawrence Talbot Chair in Engineering), Ph.D. Brown University. Tissue biomechanics, biomaterial science

Robert D. Ritchie (Chair, Materials and Science Engineering; The H. T. and Jessie Chua Distinguished Professorship in Engineering), S.C. University. Mechanical and material fatigue–crack propagation

Shanker Sayas, Ph.D. Cornell University. Numerical simulation, high performance computing, solution of linear and nonlinear partial differential equations

David J. Steigmann, Ph.D. Brown University. Tissue mechanics, biomechanical science

Robert O. Ritchie (Chair, Materials and Science Engineering; The H. T. and Jessie Chua Distinguished Professorship in Engineering), S.C. University. Mechanical and material fatigue–crack propagation

Christopher Soukup, Ph.D. U.C. Berkeley. Aerodynamics, boundary layers, combustion, rotating flows

Hari Dharan, Ph.D. University of California, Berkeley. Computation in novel substrates, nonlinear and adaptive control, robotic telepresence, control of hybrid systems, embedded systems, sensor networks, and biological motor control

Omer Saba, Ph.D. California Institute of Technology. Aerodynamics, boundary layers, combustion, rotating flows

David J. Steigmann, Ph.D. Brown University. Continuum mechanics, solid mechanics, shell theory, electrodynamics

Andrew S. Seer, (Dean, Graduate Division), Ph.D. Cornell University. Fluid dynamics and nonlinear dynamics

Masayoshi Tomizuka (Executive Dean; Dean, The Cheryl and John Neerhout Jr. Distinguished Professor), Ph.D. Massachusetts Institute of Technology. Automatic control systems, robotics and microsensors

Benson Tongue, Ph.D. Princeton University. Chaotic oscillators in dynamic systems
Mechanical Engineering

Paul K. Wright (Director, CITRIS, College of Engineering; The A. Martin Berlin Professor of Mechanical Engineering), Ph.D. University of California, Berkeley. Manufacturing processes, automation

Ronald W. Yeung, Ph.D. University of California, Berkeley, Hydrodynamics, numerical modeling, surface waves, ocean space systems

Xiang Zhang (The Ernest S. Kuh Chair in Engineering), Ph.D. University of California, Berkeley. Nanofabrication and processing in mechanical engineering

Tarek I. Zohdi (Vice Chair, Instruction), Habilitation Degree, University of Erlangen, Germany. Ph.D. University of Texas, Austin. Computational mechanics

Cyri A. Al-Malhi, Ph.D. Texas A&M University. Structural engineering

AC prefix=course satisfies American Cultures requirement

C prefix=course satisfies business majors

K prefix=honor course

B prefix=language course for business majors

R prefix=course satisfies R&C requirement

W prefix=online course

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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100—are engineering science courses covering in their sophomore year in Engineering 28. In their sophomore year, students are introduced to the profession and specialization to all mechanical engineers, and specialization in one or more phases of mechanical engineering.

Undergraduate Program

The freshman and much of the sophomore years of the program emphasize mathematics, physics, chemistry, computing, graphics, materials, and statics. Students are introduced to the profession of mechanical engineers in their freshman year in Engineering 10 and first exposed to engineering design in their sophomore year in Engineering 28. In their freshman year students are also introduced, in Engineering 7, to solving engineering problems using computers. Part of the sophomore and much of the junior year curricula focus on engineering science. The sophomore and junior year courses—Mechanical Engineering 85, 86, 100, 104, 106, 108 and Electrical Engineering and Computer Sciences 100—are engineering science courses covering dynamics, fluid mechanics, strength of materials, and statics, with elements of design and computing included. They also introduce students to the use of engineering concepts as tools to analyze component and system performance. From this conceptual foundation, a student synthesizes tools from different engineering sciences and applies them to design problems. This is the rationale for placing much of the design component of the program in the senior year. Specialization may be provided in the choice of technical electives from the subject areas of applied mechanics, automatic controls, electrochemical systems, energy conversion, fluid mechanics, heat transfer, manufacturing systems, materials processing, mechanical design, cryogenics, robotics and automation, bioengineering, and environmental engineering.

Because of the widening range of technical problems and the limited amount of specialization available in the undergraduate curriculum, qualified students should undertake study to expand their scientific and technological capability. Further details on undergraduate and graduate fields of emphasis in mechanical engineering are available in the Advanced Engineering Placement: A Guide to Undergraduate and Graduate Study at coe.berkeley.edu/college-of-engineering-announcement. Visit the department website for information on tailoring the undergraduate and graduate program.

The B.S. program is accredited in mechanical engineering by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700.

Mechanical Engineering Minor

The department offers a minor in mechanical engineering that is open to all students not majoring in ME who have completed the necessary prerequisites for the minor requirements. Information is available on the department website.

Graduate Programs

Both master’s and doctoral programs are available. The student may choose either a scientific emphasis in particular areas or integrated studies directed to professional objectives. Master of Science and Ph.D. degrees are the relevant degrees for the scientific emphasis, and the M.Eng. and D.Eng degrees for the professional one. The department also offers a program leading to dual degrees in Master of Science in engineering and Master of Public Policy. Specialization is offered in the following mechanical engineering disciplines:

- controls and dynamics,
- design,
- fluids,
- mechanics,
- materials,
- and (6) ocean engineering.

Details on various aspects of graduate study are available at mec.berkeley.edu and from the College of Engineering Announcement.

Note: In addition to the courses listed below, the Department of Mechanical Engineering offers the following courses for the Engineering section of this catalog: 10, Engineering Design and Analysis; 28, Graphic Communication in Engineering; 117, Methods of Engineering Analysis; 129, Advanced Design Graphics; 177, Advanced Programming with MATLAB; 191, Engineering Ethics; 193, California Engineer Staff; 230A, Engineering Analysis; 230B, Engineering Analysis; 231, Mathematical Methods in Engineering; 266A, Finite Difference Methods for Fluid Dynamics; 266B, Spectral Methods for Fluid Dynamics.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week in a section of 25 students. Sections 5-8 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

40. Thermodynamics. (3) Students will receive no credit for this discussion for three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 1A, Engineering 7, Mathematics 1B, and Physics 7B. This course introduces the fundamentals of energy storage, thermophysical properties of liquids and gases, and the basic principles of thermodynamics which are then applied to various areas of engineering.

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98. Supervised Independent Group Study. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Organized group study on various topics under the sponsorship and direction of a member of the Mechanical Engineering faculty. (F,SP) Staff

Upper Division Courses

101. High Mix/Low Volume Manufacturing. (3) Three hours of lecture per week. Prerequisites: Upper division standing in engineering or consent of instructor. Fundamentals of high mix/low volume (HMLV) manufacturing systems. Fundamental manufacturing and unit operations and manufacturing line considerations for work in process (WIP), manufacturing line lead time (MLT), economics, quality monitoring, and manufacturing systems. HMLV systems including just in time (JIT), kanban, buffers and line balancing; project/case studies for design of competitive manufacturing systems. (F) Domfield, McMains

102A. Introduction to Mechatronics. (4) Two hours of lecture, three hours of laboratory, and one hour of discussion per week. Prerequisites: 104, 109; 132 (corequisite); Electrical Engineering 100; Engineering 10, 28; English R1A or equivalent course. Introduction to mechatronics and sensors. Measurement statistics and error propagation. Digital data acquisition and experimental control. Basic signal processing. Introduction to the physics, applications, and limitations of sensors. Principles of mechanical communication for formal technical reports, feasibility studies, descriptions and instructions, and practice in oral presentations to technical and nontechnical audiences. (F,SP)

102B. Mechatronics Design. (3) Two hours of lecture and three hours of laboratory. Prerequisites: ME 102A, Electrical Engineering 100, and Engineering 28. Introduction to design and realization of mechatronics systems. Micro-computer architectures. Basic computer IO devices. Embedded microprocessor systems and control. IP programming such as analogue to digital converters, PWM, serial and parallel outputs. Electrical components such as power supplies, operational amplifiers, transformers, and filters. Shielding and grounding. Design of electric, hydraulic, and pneumatic actuators. Design of sensors. Design of power transmission systems. Kinematics and dynamics of robotics devices. Basic feedback design to create error signals, feedback loop design. (F,SP) Kazerooni, Staff

104. Engineering Mechanics II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: C85 and Engineering 7. This course is an introduction to the dynamics of particles and rigid bodies. The material, based on a Newtonian formulation, is illustrated with numerous examples ranging from one-dimensional motion of a single particle to planar motions of rigid bodies and systems of rigid bodies. (F,SP) Staff

106. Fluid Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: C85 and 104 (may be taken concurrently). This course introduces the fundamentals and techniques of fluid mechanics with the aim of describing and controlling engineering flows. (F,SP) Staff
107. Mechanical Engineering Laboratory. (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: 102A; senior standing. Experiments in design and analysis of systems of importance of interest to mechanical engineers. Design and planning of experiments. Analysis of data and reporting of experimental results. (F,SP) Staff

108. Mechanical Behavior of Engineering Materials. (4) Three hours of lecture, one hour of discussion, and four hours of laboratory per week. Prerequisites: C85. This course covers elastic and plastic deformation under static and dynamic loads. Failure by yieldning, fracture, fatigue, wear, and environmental factors are also examined. Emphasis is on engineering materials, heat treatment, structure-property relationships, elastic deformation and multiaxial loading, plastic deformation and yield criteria, dislocation plasticity and strengthening mechanisms, creep, stress corrosion cracking, fatigue and fracture, and contact deformation. (F,SP) Komvopoulos, Staff

109. Heat Transfer. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 40 and 106. This course covers transport processes of mass, momentum, and energy from a macroscopic view with emphasis both on understanding why matter behaves as it does and on developing practical problem solving skills. The course is divided into four parts: introduction, conduction, convection, and radiation. (F,SP) Staff

110. Introduction to Product Development. (3) Three hours of lecture per week. Prerequisites: Junior or higher standing. Provides project-based learning experience in product development with a focus on mechanical engineering systems. Design concepts and techniques are introduced, and the student’s design ability is developed in a design or feasibility study chosen to emphasize ingenuity and provide wide coverage of engineering topics. Relevant software will be integrated into studio sessions, including solid modeling and environmental life cycle analysis. Design optimization and social, economic, and political implications will be discussed. All projects will be evaluated against the “triple bottom line”: economic, societal, and environmental. Both individual and group oral presentations are made, and participation in a final tradeshow type presentation is required. Staff

C117. Structural Aspects of Biomaterials. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Biology 1A, Engineering 45, Civil and Environmental Engineering 130 or 130N or Design Engineering 102, and Engineering 190. This course covers the structural and mechanical functions of load bearing tissues and their replacements. Natural and synthetic load-bearing biomaterials are reviewed. Biocompatibility of biomaterials and host response to structural implants are examined. Quantitative treatment of biomechanical issues and constitutive relationships of tissues are covered in order to design biomaterial replacements for structural function. Material selection for load bearing applications including reconstructive surgery, orthopedics, dentistry, and cardiology are addressed. Mechanical design for structural aspects of failure and fracture are reviewed. Case studies that examine failures of devices are presented. This course includes a teaching/design laboratory component that involves design and analysis of mechanical devices and outreach teaching to the public community. Several problem-based projects are utilized throughout the semester for design analysis. In addition to technical content, this course involves various technical writing assignments and oral communication skill development and teamwork. Also listed as Biomeengineering C117. (SP) Pruitt

118. Introduction to Nanotechnology and Nanoscience. (3) Three hours of lecture per week. Prerequisites: Chemistry 1A and Physics 7B, Physics 7C and Engineering 45 (or the equivalent) recommended. This course introduces engineering students (juniors and seniors) to the field of nanotechnology and nanoscience. The course has two components: (1) Formal lectures receive a set of nanotechnology and nanoscience lectures introducing them to the field of nanotechnol-

166. Fluid Mechanics of Biological Systems. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 106 and 109 (may be taken concurrently). This is a general introduction to biological fluid mechanics. The course will primarily examine the kinematic and mechanical aspect of mammalian flow. It time allows, animal, bugs, fish, and environmental fluid mechanics will also be covered, but the majority of the course focuses on the blood flow in the human body. Prior knowledge does not presume previous knowledge of anatomy. (F,SP) Savas

167. Microscale Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: 40, 106, 109 and 106 may be taken concurrently. Physics 7B, or equivalent. Phenomena of physical, technological, and biological significance in flows of gases and liquids at the microscale. The course begins with familiar equations of Newtonian fluid mechanics, then proceeds to the study of essentially 1-D flows in confined geometries with the lubrication equations. Next is a study of the flow of thin films spreading under gravity or surface tension gradients. Lubrication theory of confined flows leads to consideration of near-wall laminar flows. Two and three-D flows are treated with Stokes’ equations. Less familiar physical phenomena of significance and utility at the microscale are then considered: inter-molecular forces, liquid jets, diffusion and advection in microfluidic devices and review agents. A review of relevant aspects of electricity and magnetism precedes a study of electrowetting and electrokinetically driven liquid flows. (F) Morris, Szeri

170. Engineering Mechanics III. (3) Three hours of lecture per week. Prerequisites: 104 or consent of instructor. This course builds upon material learned in 104, examining the dynamics of particles and rigid bodies moving in 3-D. Topics include non-fixed axis rotation, angular momentum, moments and angular momenta, kinematics of rigid bodies, and the Newton-Euler equations of motion for rigid bodies. The course material will be illustrated with real-world examples such as rolling, spinning, top, vehicles, and satellites. Applications of the material range from vehicle navigation to celestial mechanics, numerical simulations, and animations. (F) O’Reilly, Tongue


175. Intermediate Dynamics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 104 or equivalent. This course introduces and investigates the principles of motion for particles and rigid bodies. The subject matter is particularly relevant to applications comprised of interconnected and constrained discrete mechanical components. The course is illustrated with numerous examples. These range from 1-D motion of a single particle to 3-D motions of rigid bodies and systems of rigid bodies. (SP) Staff

176. Orthopedic Biomechanics. (4) Three hours of lecture and one hour of discussion/computer workshop per week. Prerequisites: Mechanical Engineering C165 or C176/Environmental Engineering C385/Civil Engineering C30 or Bioengineering 102 (may be taken concurrently). Proficiency in MATLAB or equivalent. Statics, dynamics, optimization theory, the finite element method. Applications to bone biology, fracture toughness, stress/strain/stiffness, muscle forces and joint behavior, medical implants. Applications to biomedical engineering. This course covers the Youla parametrization, basic elements of convex optimization, and finally control design using these techniques. (F,SP) Packard

190Y. Practical Control System Design: A Systematic Optimization Approach. (1) One hour of lecture per week. Prerequisites: 132 or Electrical Engineering 112 (EE 20 or Math 112, 113, 115) or consent of instructor. Knowledge of MATLAB or equivalent. The goal of this course is to provide a foundation for characterizing and understanding the mechanical behavior of systems, with bearing in mind the design and control aspects of systems. This course covers the Youla parametrization, basic elements of convex optimization, and finally control design using these techniques. (F,SP) Packard

H194. Honors Undergraduate Research. (2-4) Course may be repeated for credit. Prerequisites: 3.3 or higher upper-division technical GPA and consent of instructor and advisor. Final report required. Students who have completed a satisfactory number of advanced courses may pursue original research under the direction of one of the members of the staff. A subset of the projects will fulfill Technical Elective requirements in the Mechanical Engineering Program (unlike 198 or 199, which do not satisfy Technical Elective requirements). (F,SP) Staff

198. Directed Group Studies for Advanced Undergraduates. (1-4) Course may be repeated for credit. One or two hours of directed group study per week. Must be taken on a pass/fail basis. Prerequisites: Upper division standing and good academic standing. Group study of a selected topic or topics in Mechanical Engineering. The maximum number of courses combined may not exceed 4 units in any single term. See course description for restrictions. (F,SP) Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor and major advisor. Supervised independent study. Enrollment restrictions apply; see the introduction to Courses and Curricula section of this catalog. (F,SP) Staff

Graduate Courses

C212. Heat and Mass Transport in Biomedical Engineering. (3) Three hours of lecture per week. Prerequisites: 106 and 109 (may be taken concurrently). Formerly Mechanical Engineering 212. Fundamental processes of heat and mass transport in biological systems; organic molecules, cells, tissues, organs, whole organisms, and the circulatory and respiratory and renal systems. Motion in large and small blood vessels. Pulmonary and renal flows. Other biophysical flows: the eye, ear, eye, etc. Instrumentation for fluid measurements in biological systems and for medical diagnosis and applications. Artificial devices for replacement of organs and tissues, and devices applicable to kidney dialysis machines, artificial hearts, and ventilating assist devices. Also listed as Bioengineering C212. (F,SP) Berger, Liepmann

C214. Advanced Tissue Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 106 or equivalent, or consent of instructor. Fluid mechanics of different mechanical aspects of various physiological systems, the circulatory, respiratory, and renal systems. Motion in large and small blood vessels. Pulmonary and renal flows. Other biophysical flows: the eye, ear, etc. Instrumentation for fluid measurements in biological systems and for medical diagnosis and applications. Artificial devices for replacement of organs and tissues, and devices applicable to kidney dialysis machines, artificial hearts, and ventilating assist devices. Also listed as Bioengineering C213. (F,SP) Berger, Liepmann
220. Precision Manufacturing. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or science; undergraduate consent of instructor. Physics, design of microelectronic mechanical systems (MEMS). Micro- and nanofabrication processes, including silicon surface and bulk micromachining and non-silicon micromachining. Integration and testability processes. Microsensor and microactuator devices: electrostatic, piezoresistive, piezoelectric, thermal, magnetic transduction. Electronic position-sensing circuits and electrical and mechanical noise. CAD for MEMS. Design project is required. Also listed as Electrical Engineering C245. (F,SP) Nguyen, Pister

221. High-Tech Product Design and Rapid Manufacturing. (3) Three hours of lecture per week. Prerequisites: 119 and C218/Electrical Engineering C245 are highly recommended. Fourier transforms, parametric design and optimal design of MEMS. Emphasis on design, not fabrication. Analytic solution of MEMS problems to determine the dimensions of MEMS structures for a specific function. Trade-off of various performance requirements despite conflicting design requirements. Structures include flexure systems, accelerometers, and rate sensors. Also listed as Electrical Engineering C246. (SP) Lin

222. Advanced Manufacturing Processes. (3) Three hours of lecture per week. Prerequisites: 122 or consent of instructor. This course presents an overview of the theory of manufacturing processes, machine tool design, and process issues in quality, production rate, and flexibility of manufacturing. Nontraditional manufacturing processes will be introduced. Topics covered include: fluid power and hydraulic systems (material removal, joining, forming, and deforming), elements of machine tool error and machine tool component design, nontraditional manufacturing processes (electric discharge machining, electro-chemical machining), rapid prototyping, and process selection, optimization, and planning issues. This course incorporates a laboratory term project in the application of nontraditional manufacturing processes. (SP) Wright

223. Advanced Control Systems I. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 233 or C291F. (SP) Tomizuka, Horowitz

224. Advanced Control Systems II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 233. Linear Quadratic Optimal Control, Stochastic State Estimation, Linear Quadratic Gaussian Control, Loop Transfer Recovery, Adaptive Control, and Model Reference Adaptive Systems, Self Tuning Regulators, Repetitive Control, Application to engineering systems. (SP) Tomizuka, Horowitz

225. Parametric and Optimal Design of MEMS. (3) Three hours of lecture per week. Prerequisites: 119 and C218/Electrical Engineering C245 are highly recommended. Fourier transforms, parametric design and optimal design of MEMS. Emphasis on design, not fabrication. Analytic solution of MEMS design problems to determine the dimensions of MEMS structures for a specific function. Trade-off of various performance requirements despite conflicting design requirements. Structures include flexure systems, accelerometers, and rate sensors. Also listed as Electrical Engineering C246. (SP) Lin


227. Mechanical Behavior of Composite Materials. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Formerly 290J. Response of composite materials (fiber and particulate-reinforced materials) to static, cyclic, creep and thermomechanical loading. Manufacturing process-induced variability, and residual stresses. Fatigue behavior, fracture mechanics, and damage development. Role of the reinforcement-matrix interface in mechanical behavior. Environmental effects. Dimensional stability and thermal fatigue. Application to polymer, metal, ceramic, and carbon matrix composites. (SP) Dhanaraj

228. Computer-Aided, Optimal Mechanical Design. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Fundamental principles of optimization. Computer-aided optimization techniques and application on the computer. (SP) Agogino

229. Design of Basic Electromechanical Devices. (3) Three hours of lecture per week. Prerequisites: C291, graduate standing or consent of instructor. Fundamental principles of magnetics, electro-magnetics, and magnetostatics. Analysis of design and operation of electromechanical devices. Type of device to be used in a particular application and dimensions of parts for the overall design will be discussed. Typical applications covered will be linear actuators, stepper motors, AC motors, and DC brush and brushless motors. A design project is required. (F,SP) Staff

230. Real-Time Applications of Mini- and Microprocessors. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing in engineering or consent of instructor. Undergraduate MEMS and microprocessors, operating in real time, have become ubiquitous components in engineering systems. The purpose of this course is to build competence in the engineering use of such systems through lectures stressing small computer structure, programming, and output/input operation, and through laboratory work with mini- and microcomputer systems. (F) Dharan

231. Introduction to MEMS Design. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing in engineering or science; undergraduate consent of instructor. Physics, design of microelectronic mechanical systems (MEMS). Micro- and nanofabrication processes, including silicon surface and bulk micromachining and non-silicon micromachining. Integration and testability processes. Microsensor and microactuator devices: electrostatic, piezoresistive, piezoelectric, thermal, magnetic transduction. Electronic position-sensing circuits and electrical and mechanical noise. CAD for MEMS. Design project is required. Also listed as Electrical Engineering C245. (F,SP) Nguyen, Pister

232. Design of Basic Electromechanical Devices. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: C291, graduate standing in engineering or science and one course in control. Formerly 290J. Response of composite materials (fiber and particulate-reinforced materials) to static, cyclic, creep and thermomechanical loading. Manufacturing process-induced variability, and residual stresses. Fatigue behavior, fracture mechanics, and damage development. Role of the reinforcement-matrix interface in mechanical behavior. Environmental effects. Dimensional stability and thermal fatigue. Application to polymer, metal, ceramic, and carbon matrix composites. (SP) Dharanaraj

233. C221. Biomimetic Engineering—Engineering from Biology. (3) Three hours of lecture per week. Prerequisites: Graduate standing in engineering or consent of instructor. Students will have sufficient background to independently study the mechanical behavior of most biological tissues. Formal discussion sections with guest instructors. Also listed as Bioengineering C214. (SP) Staff

234. Mechanical Behavior of Engineering Materials. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Civil and Environmental Engineering 130 or 130N, Engineering 45. A survey of the structure and mechanical properties of advanced engineering polymers. Topics include rubber elasticity, viscoelasticity, mechanical properties, yielding, deformation, and fracture mechanisms of various classes of polymers. The course will discuss degradation schemes of polymers and long-term performance issues. The class will include polymer applications in bioengineering and medicine. Also listed as Bioengineering C223. (F) Staff

235. Design for Medical Devices. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 233. Design for medical devices, including practical and theoretical aspects of medical device design. Design of medical devices, design and analysis of single and multi-variable feedback control systems in transform and time domain. State observer. Feedforward/preview control. Application to engineering systems. (F) Dharan

236. Control of Nonlinear Dynamic Systems. (3) Three hours of lecture per week. Prerequisites: 233. Fundamental properties of nonlinear systems. Stability of nonlinear systems. Control design via Lyapunov methods. Equivalent nonlinear systems. Stability of nonlinear systems. Three hours of lecture and one hour of discussion per week. (SP) Hedrick


238. Advanced Design and Automation. (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: Graduate standing in engineering or science and one course in control. This course will provide students with a solid understanding of smart products and the use of embedded microcomputers in products and machines. The course has two components: formal lectures on design of smart machines and products that use embedded microcomputers. The materials cover machine components, actuators, sensors, basic electronic devices, embedded microprocessor systems and control, power transfer components, and mechanism design. (Projects—students will design and construct prototype products that use embedded microcomputers. (F) Kazerooni

364 / Mechanical Engineering
240A. Advanced Marine Structures I. (3) Students will receive no credit for 240A after taking C240A/Ocean Engineering C240A. Three hours of lecture per week. Prerequisites: Graduate standing; Statistics 25 or equivalent. Formerly C240A. This course introduces a probabilistic description of ocean waves and wave loads acting on marine structures. Theory presented is treated with special emphasis on the structural and dynamical characteristics of the structure as well as the behavior of its members under lateral and compressive loads. Overall response of the structure as well as students will receive no credit for 241A after taking C241A/Ocean Engineering C241A. Three hours of lecture per week. Prerequisites: Engineering 165 recommended or graduate standing. Formerly C241A. Navier-Stokes Equations. Boundary-layer theory, laminar, and turbulent. Frictional resistance. Boundary layer over water surface. Separated flow modeling. Steady and unsteady flow. Momentum theorems. Three-dimensional water-wave theory. Formulation of wave resistance of ships. Michell’s solution. Wave patterns. Applications. (FSP) Yeung


251. Heat Conduction. (3) Three hours of lecture per week. Prerequisites: 151; Engineering 230A. Analytical and numerical methods for the determination of the conduction of heat in solids. (F) Staff

252. Heat Convection. (3) Three hours of lecture per week. Prerequisites: 151, 265A; Engineering 230A. The mathematical description of convective heat transfer. Forced convection in laminar and turbulent flow over surfaces and within ducts. (SP) Greif

253. Thermal Radiation. (3) Three hours of lecture per week. Prerequisites: 151. Thermal radiation properties of gases, liquids, and solids; the calculation of radiant energy transfer. (F) Grigopoulos, Majumdar


256. Combustion. (3) Three hours of lecture per week. Prerequisites: 40, 106, and 109 (106 and 109 may be taken concurrently). 140 is recommended. The course is designed to introduce students to combustion phenomena. The course will cover in detail conservation equations with reactions. Laminar and turbulent deflagrations. Rankine-Hugoniot relations. Diffusion flames. Boundary layer combustion, ignition, and stability. (SP) Dibble

257. Advanced Combustion. (3) Three hours of lecture per week. Prerequisites: 256. Critical analyses of combustion phenomenon. Conservation relations applied to reacting systems. Reactions are treated by both asymptotic and numerical methods. Real hydrocarbon mixtures. Theory and experiments are discussed in detail for both laminar and turbulent flows. (F) Staff

258. Heat Transfer with Phase Change. (3) Three hours of lecture per week. Prerequisites: 151. Heat transfer associated with phase change processes. Topics include thermodynamics of phase change, evaporation, condensation, nucleation and bubble growth, two phase flow, convective boiling and condensation, melting and solidification. (SP) Carey

259. Microscale Thermophysics and Heat Transfer. (3) Three hours of lecture per week. Prerequisites: 151, 254, or consent of instructor. This course introduces advanced statistical thermodynamics, nonequilibrium thermodynamics, and concepts used to analyze thermophysics of microscale systems; and explores applications in which microscale transport plays an important role. (SP) Carey, Majumdar

260A. Advanced Fluid Mechanics I. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 106, 185 (strongly recommended) or consent of instructor. Introduces the foundations of fluid mechanics. Exact flow solutions are used to develop a physical insight of the fluid flow phenomena. Rigorous derivation of momentum, incompressible and compressible potential flows. Canonical viscous flows. (F) Staff

260B. Advanced Fluid Mechanics II. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 260A or consent of instructor. Develops a working knowledge by identifying the essential physical mechanism in complex canonical flow problems which leads to simplified yet accurate formulation. Boundary layers, creeping flows, rotational flows, rotating flows. Stability and transition, introduction to turbulence. (SP) Staff

260D. Advanced Fluid Mechanics IV. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 260A and B, or 241A; or consent of instructor. Discussion of linear and non-linear solutions of incompressible flow and boundary layers beyond material in 260A-260B. Time-harmonic elements of free-surface flows. (FSP) Berger

262. Hydrodynamic Stability and Instability. (3) Three hours of lecture per week. Prerequisites: 185 and 106, or equivalents. Discussions of linear and non-linear instabilities in a variety of fluid flows: thermal convection, Rayleigh-Taylor flows, shearing flows, circular and cylindrical Couette flows (i.e., centrifugal instability). Graphical, iteration, perturbation, and asymptotic methods. (F) Marcus


266. Dynamics and Stability of Engineering and Geophysical Flows with Rotation, Convection, and Generalized Laboratory Physics. (3) Prerequisites: 260A and 260B or consent of instructor. Formerly 260C. A presentation of four related topics in high Reynolds number flow: stability theory, waves, rotational flows, and geophysical/astrophysical fluid dynamics. Linear stability of classical, shear, con-

vectoring, and rotating flows are reviewed. Weakly non-linear stability is examined with amplitude equations and numerical studies of sub-critical instabilities of closed and open flows. Rapidly rotating flows are analyzed by asymptotically deriving the quasi-geostrophic and shallow water equations. Examples of geophysical flows include vortex dynamics in the atmosphere and geophysical fluid waves (Rossby, Poincare, inertial, internal gravity and Kelvin). The mathematical formulation of hyperbolic waves in stratified, free surface, and compressible flows is discussed and applied to flows with shocks and breaking waves. (FSP) Staff

268. Physicochemical Hydrodynamics. (3) Three hours of lecture per week. Prerequisites: A first graduate course in fluid mechanics is recommended. An introduction to the hydrodynamics of capillarity and wetting, balance laws and short-range forces. Dimensionless numbers, scaling and lubrication approximation. Rayleigh instability. Marangoni effect. The moving contact line. Wetting and short-range forces. The dynamic contact angle. Dewetting. Coating flows. Effect of surfactants and electric fields. Wetting of rough or porous surfaces. Contact angles for evaporating systems. Also listed as Chemical Engineering C268. (FSP) Morris

273. Oscillations in Linear Systems. (3) Three hours of lecture per week. Prerequisite: 104 and 133. Response of discrete and continuous dynamical systems, damped and undamped, to harmonic and general time-dependent loading. Convolution integrals and Fourier and Laplace transform methods. Lagrange’s equations; Eigensolutions; Orthogonality; generalized coordinates; nonreciprocal and degenerate systems; Rayleigh quotient. (F) Ma


275. Advanced Dynamics. (3) Three hours of lecture per week. Prerequisites: 104. Introduction to statistical mechanics for engineers interested in the constitutive behavior of matter with a particular interest in continua. Systems of interest will be acoustic and crystal processing, rotating and Lagrangian systems. Legendre transform and Hamilton’s equations, Cyclic coordinates, Canonical transformations, Hamilton-Jacobi theory, integrability. Dynamics of coupled symmetric systems. Approximation theory. Current topics in analytical dynamics. (F) Staff

277. Oscillations in Nonlinear Systems. (3) Three hours of lecture per week. Prerequisites: 175. Oscillations in nonlinear systems having one or two degrees of freedom. Qualitative and quantitative methods: graphical, iteration, perturbation, and asymptotic methods. Self-excited oscillations, limit cycles, and domains of attraction. (FSP) Szeri

C279. Statistical Mechanics of Elasticity. (3) Three hours of lecture per week. Prerequisites: 185, or Civil and Environmental Engineering C231, or Material Science and Engineering C231, or consent of instructor. Introduction to statistical mechanics for engineers interested in the constitutive behavior of matter with a particular interest in continua. Systems of interest will be acoustic and crystal processing, rotating and Lagrangian systems. Applications to failure analysis. Stochastic estimation and control and their applications to vibratory systems. (SP) Staff

280A. Introduction to the Finite Element Method. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematical Methods: Mathematics 50A-50B; some familiarity with elementary field theories of solids/fluid mechanics and/or thermal field theories. Formerly 280C. Weighted-residual and variational methods of approximate solution of partial differential equations. Formulation of finite element spaces. Formulation of
280B. Finite Element Methods in Nonlinear Continua. (3) Three hours of lecture per week. Prerequisites: 283A or equivalent; background in continuum mechanics at the level of 185. A brief review of continuum mechanics. Consistent linearization of kinematical variables and balance laws. Incremental formulations of the laws of motion. Solution methods for the nonlinear field equations by Newton’s method and its variants. General treatment of constraints. Applications to nonlinear material and kinematical modeling on continua. (SP) Papadopoulos

281. Methods of Tensor Calculus and Differential Geometry. (3) Three hours of lecture per week. Prerequisites: Mathematics 53 and 54. Methods of tensor calculus and classical differential geometry. The tensor concept and the calculus of tensors, the Riemann­ Christoffel tensor and its properties, Riemannian and Euclidean spaces. Geometry of a surface, formulas of Weingarten, and equations of Gauss and Codazzi. (F) Staff

282. Theory of Elasticity. (3) Three hours of lecture per week. Prerequisites: 283. Wave Propagation in Elastic Media. (3) Three hours of lecture per week. Prerequisites: 185. Propagation of mechanical disturbances in unbounded and bounded media. Surface waves, wave reflection and transmission at interfaces and boundaries. Stress waves due to periodic and transient sources. Some additional topics may vary with instructor. (F) Bogy, Steigmann

283. Wave Propagation in Elastic Media. (3) Three hours of lecture per week. Prerequisites: 185. Propagation of mechanical disturbances in unbounded and bounded media. Surface waves, wave reflection and transmission at interfaces and boundaries. Stress waves due to periodic and transient sources. Some additional topics may vary with instructor. (F) Bogy


285A. Foundations of the Theory of Continuum Media. (3) Three hours of lecture per week. Prerequisites: 185. Formerly 285A. A general development of thermodynamics of deformable media, elastic pro­duction, and related entropy inequalities. Thermome­chanical response of dissipative media, including those for viscous fluids and nonlinear elastic solids. A dis­cussion of invariance, internal constraints, material symmetry, and other special topics. (FSP) Casey

285B. Surfaces of Discontinuity and Inhomogeneities in Deformable Continua. (3) Three hours of lecture per week. Prerequisites: 185. Finitely deform­ing the continuum. Moving discontinuities. Shock waves and acceleration waves in elastic materials. The Elashby tensor and Elash­bian mechanics. Fracture, Microstructured continua. (FSP) Casey

285C. Electrodynamics of Continuum Media. (3) Three hours of lecture per week. Prerequisites: A first course in continuum mechanics (such as 185 or Civil Engineering 231). Formerly 284B. This course pre­sents the fundamentals of electromagnetic interac­tions in deformable and continuous media. It develops the background necessary to understand various modern technologies involving MEMS devices, sensors and actuators, plasmas, and a wide range of additional phenomena. Topics in this course are of funda­mentals, beginning with Maxwell’s equations in vacuum, the ether relations and their extension to electromagnetic interactions in materials. The treat­ment is general within the limits of nonrelativistic physics and accommodates coupling with mechan­i­cal and thermal effects. The topics discussed are all developed at a general level including the effects of finite deformations. Various linear models, which are especially useful in applications, are developed through specialization of general theory. This course will be of interest to students in engineering, physics, and applied mathematics. (FSP) Steigmann

286. Theory of Plasticity. (3) Three hours of lecture per week. Prerequisites: 185 or equivalent. This course focuses on methods for the modeling, analysis, numerical simu­lation, and design of microheterogeneous materials, with a central theme being the determination of rela­tionships between the microstructure and the macro­scopic response or “macroscopic property.” The course is self-contained and is designed in an interdisciplinary manner for graduate students in engineering, applied mathematics, materials science, and physics who are interested in the development of laboratory analysis and design of new materials. Examples draw primarily from various mechanical, diffusive, and ther­mal applications, although the techniques developed apply to any materials system possessing oscillatory coefficients. (SP) Zohdi


289. Theory of Shells. (3) Three hours of lecture per week. Prerequisites: 185 and 281. A direct formulation of a general theory for shells based on the concept of Cosserat (or Directed) Surfaces. Non­linear constitutive equations for finitely deformed elastic shells. Linear theory and a special nonlinear theory with small strain accompanied by large or moder­ately large rotation. Applications. (FSP) Johnson, Steigmann

290A. Nonlinear Dynamics of Continuous Sys­tems. (3) Three hours of lecture per week. Prerequisites: 175, 185. This course uses methods from dynamical systems theory and chaos theory to analyze the nonlinear dynamics of elastic bodies. Various methods for modeling these bodies will be used, and the dynamics predicted by these models of the body will be explored, including those of nonlinearly elastic rods and strings. (SP) O’Reilly

290C. Topics in Fluid Mechanics. (3) Three hours of lecture per week. Prerequisites: Consent of instruc­tor. Lectures on special topics which will be announced at the beginning of each semester that the course is offered. Topics may include: fluid dynamics, geophysical fluid dynamics, bioluid dynamics, ocean­ography, free surface flows, non-Newtonian fluid me­chanics, among other possibilities. (FSP) Savas, Yeung

290D. Solid Modeling. (3) Three hours of lecture per week. Prerequisites: Computer Science 61B or equiv­alent, linear algebra; Computer Science 184 recom­mended. Graduate survey of solid modeling research. Representations and algorithms for 3-D solid geome­try; applications in design, analysis, planning, and manu­facturing of mechanical parts, including CAD/CAM, reverse engineering, meshing, feature recognition, mold-making, and rapid prototyping. (SP) MCPains


290H. Green Product Development: Design for Sustainability. (3) Three hours of lecture per week, plus optional discussion section. Prerequisites: Graduate standing in engineering or Information, or consent of instructor. The focus of the course is management of innovation processes for sustainable products, from product definition to sustainable manufacturing and financial models. Using a project in which students will be asked to design and develop a product or service focused on sustainability, we will teach processes for engaging customer awareness, analyzing that data, developing a product specification, sketching and building product prototypes, and interacting with the customer/community during product development. The course incorporates frameworks on experience in the “green” product development process. The course will be a management of technology course offered jointly with the College of Engi­neering and the Haas School of Business. In addition, it will also receive credit towards the new Certificate on Engineering Sustainability and Environmental Man­agement Program. We aim to have half MBA students and half engineering students (with a few other stu­dents, such as from the School of Information) in the class. The instructors will facilitate students to form mixed disciplinary reams for the development of their “green” products. (SP) Agogino, Beckmann

290J. Predictive Control for Linear and Hybrid Sys­tems. (3) Three hours of lecture per week. Prerequisites: 232. Advanced optimization, polyhedra manipulation, and multivariate programming. Invariant set theory. Analysis and design of constrained predictive controllers for hybrid dynamical systems. Formulation of hybrid systems. (SP) Agogino

290L. Introduction to Nano-Biology. (3) Three hours of lecture and one hour of discussion per week. This course will introduce students to cutting-edge engineering to the nascent field of nano-biology. The course is comprised of both formal lectures and projects. Lectures will include an introduction to both molecular biology (components of cells, protein struc­ture and function, DNA, gene regulation, etc.) and nanotechnology (“bottom up” and “top down” nano­technologies), an overview of current instrumentation and methods, and an introduction to the integra­tion of molecular biology with nanotechnology (for sensing or labeling purposes, elucidating information on cells, etc.), and an introduction to systems biology (design principles of biological circuits). Students will read and present a variety of current journal papers to the class and lead a discussion on the various works. (SP) Sohn

290M. Expert Systems in Mechanical Engineer­ing. (3) Three hours of lecture per week. Prerequisites: 102A and 102B or equivalent. Fundamental concepts of artificial intelligence and decision analysis in mechan­i­cal engineering. Fundamentals of analytic design, probability theory, failure analysis, risk assessment, Bayesian statistics, and logical inference. An introduction to expert systems in probabilistic mechanical engineer­ing design and failure diagnostics. Use of automated influence diagrams to codify expert knowledge and to evaluate optimal design decisions. (SP) Agogino
290N. System Identification. (3) Three hours of lecture per week. Prerequisites: 232, Electrical Engineering and Computer Sciences 212A or consent of instructor. The course is intended to provide a comprehensive treatment of both classical system identification and recent work in control-oriented system identification. Numerical, practical, and theoretical aspects of system identification will be covered. Topics treated include time and frequency domain methods, generalized parameter estimation, identification of structured nonlinear systems, modeling uncertainty bounding, and state-space methods. (F,SP) Pooija

290P. New Product Development: Design Theory and Practice. (3) Three hours of lecture per week. Prerequisites: Graduate standing, consent of instructor. This course is aimed at developing the interdisciplinary skills required for successful product development in today's competitive marketplace. We expect students to be disciplinary experts in their own field (e.g., engineering, business). By bringing together multiple perspectives, we will learn how product development of instructor. This course deals with functional effective products that exceed customers' expectations. (F) Apogono

290Q. Dynamic Control of Robotic Manipulators. (3) Three hours of lecture per week for five weeks, one hour of lecture per week for 10 weeks, four hours of lecture per week for 4 weeks. Prerequisites: Consent of instructor. Dynamic and kinematic analysis of robotic manipulators. Sensors (position, velocity, force, and vision). Actuators and power transmission for direct drive and indirect drive. Point to point control. Straight and curved path following. Industrial practice in servo control. Applications of optimal linear quadratic control, preview control, nonlinear control, and direct/indirect adaptive controls. Force control and compliance control. Collision avoidance. Utilization of dynamic controls (SP) Horowitz, Kazerooni

290R. Topics in Manufacturing. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Consent of instructor. Advanced topics in manufacturing research. Topics vary from year to year. (F,SP) Domnick, McMains, Wright

C290S. Hybrid Systems and Intelligent Control. (3) Three hours of lecture per week. Formerly 291E. Analysis of hybrid systems formed by the interaction of continuous time dynamics and discrete-event controllers. Discrete-event systems models and language description to a large extent to relevant advanced machine and automata. Model verification and control of hybrid systems. Signal-to-symbol conversion and logic controllers. Adaptive, neural, and fuzzy-control systems. Applications to robotics and Intelligent Vehicle and Highway Systems (IVHS). Also listed as Electrical Engineering C291E. Staff

290T. Plasmonic Materials. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Physics 110A or consent of instructor. The course deals with the fundamental aspects of plasmonic materials. The electromagnetic responses of those artificially constructed materials will be discussed. Physics of surface plasmons and dispersion engineering will be introduced. Resonant phenomena associated with the negative permittivity and permeability and the left-handed propagation will be presented. Methods of design, fabrication, and characterization of plasmonic materials will be discussed. (F,SP) Zhang

C290X. Advanced Technical Communication: Proposals, Patents, and Presentations. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering, physics, or mathematics. Investigations of advanced problems in mechanical engineering. (F,SP) Staff

290Z. Advanced Technical Communication: Proposals, Patents, and Presentations. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering, physics, or mathematics. Investigations of advanced problems in mechanical engineering. (F,SP) Staff

290Z. Topics in Control, Modeling, and Optimization. (3) Three hours of lecture per week. Prerequisites: 232 and 233. Advanced topics in control, modeling and optimization research with extensive interactive participation to diverse disciplines, including engineering systems and mechatronics. Topics will vary from year to year and will be announced at the beginning of each semester that the course is offered. Theoretical issues covered in the course include topics such as iterative learning control, control over networks, and modeling for controls. The illustrative applications will be drawn from such topics as mechatronics, engineering and Computer Sciences 221A or consent of instructor. This course is open to teaching assistants of mechanical engineering. (F,SP) Staff

298. Group Studies, Seminars, or Group Research. (1-8) Course may be repeated for credit. Sections 1-49 to be graded on a satisfactory/unsatisfactory basis. Sections 50 and above to be graded on a letter-grade basis. Advanced studies in various subjects through special seminars on topics to be selected each year. Informal group studies of special problems, group participation in comprehensive design projects, or group research on complete problems for analysis and experimentation. (F,SP) Staff

C298A. Topics in Fluid Mechanics. (1,2) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Lecturers will announce special topics to be covered at the beginning of each semester that the course is offered. Topics may include transport and mixing, geophysical fluid dynamics, biofluid dynamics, oceanography, free surface flows, non-linear fluid dynamics, among other possibilities. Also listed as Environ Sci, Policy, and Management C291, Physics C290I, Mathematics C290C, Chemical Engineering C295M, Civil and Environ Sci, Chemical Engineering C291K, and Bioengineering C290C. (F,SP) Staff

299. Individual Study or Research. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing in engineering, physics, or mathematics. Investigations of advanced problems in mechanical engineering. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (and other doctoral degrees). (F,SP) Staff

Professional Courses

301. Teaching of Mechanical Engineering at the University Level. (1-6) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Weekly seminars and discussions on effective teaching methods. Educational objectives. Theories of learning. The lecture and alternative approaches. Use of media resources. Student evaluation. Laboratory instruction. Curriculum in mechanical engineering. Practice teaching. This course is open to teaching assistants of mechanical engineering. (SP) Staff
Note: All prerequisites must be taken for a letter grade.

Requirements for Graduation
At least 30 upper division units distributed over the following three areas:

(1) The following four core courses in media studies:
- 101, 102, C103, and any one from the following list: 104A, 104B, or C104C.

(2) One of the following methods courses: Anthropology 190A; Media Studies 130; Political Science 3 or 132A-132B; Psychology 101; Sociology 5 or 105.

(3) Four courses from the following list: African American Studies 142A, 142B; American Studies 112A,112B, C172; Anthropology 138A, 139, 144, 149, 158B, 166; English 173, 176; Film 160; Journalism 180; Linguistics 150; Media Studies 160, 170, 180, 190; Political Science 106A, 111A, 161, 164A; Psychology 124, 160; Sociology 110, 140, 150, 156, 160, 170; UGBA 106, 165.

Note: These requirements are in addition to the prerequisites for admission to the major. All requirements for graduation in the major must be taken for a letter grade. Any substitutions must be approved by the major adviser.

Transfer Students
Transfer students may complete Media Studies 10 at Berkeley, but are urged to complete other major prerequisite courses before arriving on campus. New transfers should see the major adviser on arrival in order to have transferred prerequisites approved. Transfers may need assistance in adding Media Studies 10 to their schedules.

Honors Program
To be admitted to the Honors Program, a student must have attained at least a 3.5 GPA overall in the University and a 3.5 GPA in the major. In order to be granted honors, a student must write a thesis which in the judgment of the thesis director and the adviser is characterized by superior distinction (Media Studies H195).

Lower Division Courses

10. An Introduction to Mass Media in America. (4) Three hours of lecture and two hours of discussion per week. Formerly Mass Communications 10. This course will examine and develop a critical understanding of American mass media from social, historical, philosophical, cultural, and other perspectives. It is designed to foster a critical understanding of mass media, inviting students to question and critique the many messages of the different cultural and social theoretical approaches used to analyze visual images and explain the role of visual media in today’s society. (SP) Staff

102. Effects of Mass Media. (4) Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Formerly Mass Communications 102. This course will examine the content and history of mass communication on the college campus. (F,SP) Staff

104-A. The First Amendment and the Press. (3) Three hours of lecture/discussion/field work per week. Prerequisites: Media Studies major or consent of instructor. Formerly Mass Communications 104. The course considers the philosophical and historical underpinnings of the First Amendment guarantee of press freedom, with particular emphasis on the practical implications of major Supreme Court decisions. The focus is on the contemporary legal rights and obligations of the print and broadcast media with regard to libel, privacy, press intimidation, obscenity, press, and news gathering, and distribution to information. (SP) Staff

104B. The History of Journalism. (3) Three hours of lecture per week. Prerequisites: 10 or consent of instructor. Formerly Journalism 141. The history of journalism is not a broad subject—far broader than can comprehensively be covered in a single course. So necessarily, this course takes an idiosyncratic approach. This course examines how news has been discovered, and defined, in the United States from its early modern origins to the present. It will also focus on particular areas of journalism. The class will take a critical look at how wars get reported on, including the current war in Afghanistan. The class will examine the role of journalists in the rise of the Cold War more than half a century ago. It will also examine the importance of media barons by studying two highly regarded journalists, the other of Katherine Graham. And finally, the class will look at the role journalists played in unseating President Nixon. (F) Goldstein

130. Research Methods in Media Studies. (4) Four hours of lecture per week. Prerequisites: 10 or permission of instructor. Formerly Mass Communications 130. This course is intended to familiarize students with some of the primary research methods used to study mass media texts and audiences (and the relationship between the two). Because the field of media studies has historical roots in both the social sciences and humanities, the course will cover both quantitative and qualitative approaches to communications research. Course readings will describe research methods, offer examples of research projects and findings, and present critiques of research studies and methods. Course assignments will involve designing and conducting a single or multiple projects on a single topic of the student’s choosing in order to gain a fuller understanding of various research methods and their limitations and strengths. There are five separate research projects, and students must complete the first project and may conduct any three of the remaining four projects. Students must present and discuss their research findings for one project to the class. (F) Retzinger

140. Media and Politics. (4) Four hours of lecture per week. Prerequisites: Junior or senior standing in the media studies major. This course will examine the influence of consumer marketing trends and techniques on presidential campaigns, and on political culture more broadly. How much truth is there to the idea that selling politicians is like “selling soap”? What is the difference between the psychology of the citizen and the psychology of the consumer? How are the political process and democratic discourse being transformed, for better or worse, by the use of such techniques? (F,SP) Staff

150. Topics in Film/Monster Films. (4) Course may be repeated for credit. Four hours of seminar per week. Prerequisites: 10 or consent of instructor. Formerly Mass Communications 150. This course employs theory to examine different film genres, historical periods, and topics. (F) Levine
160. International Media. (4) Course may be repeated for credit as topic varies. Four hours of lecture per week. Prerequisites: Media studies major or consent of instructor. Formerly Mass Communications 160. Case studies of the foreign mass media. Focus may be on the press and publishing, broadcasting, documentaries, or new media. Possible topics: Pacific Rim, European, experience in China, Israeli and Palestinian media. (F) Staff

170. Cultural History of Advertising. (4) Course may be repeated for credit as topic varies. Four hours of lecture per week. Prerequisites: Media studies major or consent of instructor. Formerly Mass Communication 170. Focus on the history of advertising and the roots of consumer culture in the United States. Presents contrasting approaches to the study of advertising and the analysis of advertising themes and images. (F) Staff

180. Television Studies. (4) Course may be repeated for credit as topic varies. Four hours of lecture per week. Prerequisites: Media studies major or consent of instructor. Formerly Mass Communications 180. This course examines contemporary approaches to the study of television, investigating television’s social, political, commercial, and cultural dimensions. Readings and assignments require students to apply critical perspectives to television programming and to the analysis of television texts. (F) Staff

190. Special Topics in Mass Communications. (4) Course may be repeated for credit. Four hours of seminar per week. Prerequisites: Media studies major or consent of instructor. Formerly Mass Communications 190. Special topics to be offered only to mass communications majors who have already completed 12 units of upper division work in the major. Advanced study in mass communications with topics to be announced each semester. (F,SP) Staff

H195. Honors Colloquium. (3) Three hours of seminar per week. Prerequisites: Media studies majors—Formerly Mass Communications H195. Under the supervision of the instructor, students will work toward preparing scholarly theses in the field, basing their work on theoretical considerations and, where applicable, analyzing empirical data. (SP) Staff

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours of work per semester plus regular meetings with the faculty supervisor. Formerly Mass Communications C196W. Students work in selected internship programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring organization and the student. Students are required to produce two progress reports for their faculty coordinator during the course of the internship, as well as a final paper for the course consisting of at least 35 pages. Other requirements approved by the faculty supervisor. Also listed as Gender and Women’s Studies C196W, History of Art C196W, Undergrad Interdisciplinary Studies C196W, History C196W, Political Economy C196W, Sociology C196W, and Political Science C196W.

198. Directed Group Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Media studies major, with at least junior standing. Formerly Mass Communications 198. Seminar to be developed to produce two progress reports for their faculty coordinator during the course of the internship, as well as a final paper for the course consisting of at least 35 pages. Other requirements approved by the faculty supervisor. Also listed as Gender and Women’s Studies C196W, History of Art C196W, Undergrad Interdisciplinary Studies C196W, History C196W, Political Economy C196W, Sociology C196W, and Political Science C196W.

199. Supervised Independent Study for Advanced Undergraduates. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Must be taken on a passed/not passed basis. Prerequisites: Media studies major, with at least junior standing. Formerly Mass Communications 199. Independent study to be arranged by arrangement with faculty. (F,SP) Staff

200. Introduction to Research Materials and Methods. (4) Three hours of lecture per week. Prerequisite: Media studies major or consent of instructor. Formerly Mass Communications 200. Graduate students, summer term. Introduction to the use of such skills. (F) Staff

Medieval Studies (College of Letters and Science)

Program Office: CASMA, 7233 Dwinnelle Hall, (910) 642-4211, medieval.berkeley.edu
Director: Katherine O’Brien O’Keefe, Ph.D., Graduate Advisor: C. Tennant, Ph.D., and Steven Justice, Ph.D.

Professors
Robert Alter, Ph.D. (Near Eastern Studies/Comparative Literature)
Albert Russell Acocli, Ph.D. (Italian Studies)
Susanna Elm, Ph.D. (History/Religious Studies)
Charles B. Faulhaber, Ph.D. (Spanish and Portuguese)
David Hult, Ph.D.
Steven Justice, Ph.D. (English)
Geoffrey Kozol, Ph.D. (History)
Niklaus Largier, Ph.D. (German)
John Lindeque, Ph.D. (Scandinavian)
Maria Massoud, Ph.D. (History)
Laurent Mayali, License en Droit, M.A., Docteur d’Etat en Droit (Daw)
Jennifer Miller, Ph.D. (English)
Katherine O’Brian O’Keefe, Ph.D. (English)
Loren Partridge, Ph.D. (Art History/Italian Studies)
Irmgard Raffelt, Ph.D. (German)
Thomas F. Shannon, Ph.D. (German/Dutch Studies)
Elaine C. Tennant, Ph.D. (German)
Thomas Brady (Emeritus), Ph.D.
Carol J. Clovis (Emeritus), Ph.D.
Louse George (Emeritus), Ph.D.
Joseph J. Duggan (Emeritus), Ph.D.
Mary Kay (Emeritus), Ph.D. in the depth of Ph.D.
Gerd Hilker (Emeritus), Ph.D.
Leonard H. Johnson (Emeritus), Ph.D.
Anne Middleton (Emeritus), Ph.D.
James T. Monroe (Emeritus), Ph.D.
Charles E. Musgrave (Emeritus), Ph.D.
Alan Nelson (Emeritus), Ph.D.
Johan P. Snapczeck (Emeritus), Ph.D.
Randolph Starn (Emeritus), Ph.D.
David H. Wright (Emeritus), Ph.D.

Associate Professors
Steven Bottcher, Ph.D. (Italian Studies)
Gary B. Holland, Ph.D. (Linguistics)
Daniel F. Melior (Emeritus/Celtic Studies)
Maureen Miller, Ph.D. (History)
Ignacia E. Navarrete, Ph.D. (Spanish and Portuguese)
Maura Nolan (English)

Assistant Professors
Frank Bezner, Ph.D. (Classics)
Emily Thorow, Ph.D. (English)

Lecturers
Kathryn Klar, Ph.D. (Celtic Studies)
Anna Lee Rejno, Ph.D. (Celtic Studies)

The Program in Medieval Studies

The Program in Medieval Studies at Berkeley is an interdisciplinary group that coordinates and sponsors lectures, events, and visiting professorships; promotes scholarly research common to medievalists of different academic departments; and communicates information of interest among them. The Committee on Medieval Studies offers a concurrent Ph.D. degree on which students may both have a home department and training in the core disciplines of medieval studies.

The Concurrent Ph.D. Degree

Graduate students must be accepted for admission to a regular department (e.g., English or History) before applying for a concurrent degree in medieval studies. The degree granted is the concurrent Ph.D. in the major department. Graduates of medieval studies (e.g., English and medieval studies, history and medieval studies). The concurrent Ph.D. is designed to preserve an established standard of training in a major subject while broadening the student’s experience in another of the field. A candidate for the concurrent Ph.D. is expected to fulfill all the Ph.D. requirements of the major field of study. In addition, candidates for this concurrent degree program must fulfill the following requirements:

1.Completion of three courses, which must include: Medieval Studies 200; History 275, or History 280 on a solely medieval topic; and a course from outside the student’s home department (a list of such courses is posted on the program website).
2. Advanced competence in Latin, demonstrated either through a special examination administered by the program or through coursework.
3. Reading proficiency in a medieval form of a modern European language outside the major field of study, either through examination administered by the program or through coursework (an upper-division or graduate-level literature course; ordinarily drawn from a list posted on the website).
4. Working proficiency in manuscript studies (palaeography, diplomatic, or codicology), as demonstrated through coursework (appropriate upper-division or graduate-level course at Berkeley or appropriate graduate-level course or workshop elsewhere) or through presentation of an extended research paper making substantial and original use of such skills.
5. A field statement of 30-50 pages, to be completed before the qualifying examination, which situates the major area of interest in an interdisciplinary setting.
7. Regular participation in the Medieval Studies Colloquium, and one presentation of dissertation/ work in progress to that colloquium.

Undergraduate Program

Students may minor in medieval studies by completing any five upper division or graduate courses in the program. Visit the program website for more information. Students whose interests lie in the medieval period may consider setting up an individual major (for requirements, see an undergraduate advisor in the College of Letters and Science). A proposal for an undergraduate minor is pending. If approved, it will be announced on the program website and in the online General Catalog.

Curriculum

The program offers some of its own courses. These include Medieval Studies 200, the graduate proseminar; Medieval Studies 150 and 250, two special topics courses; and occasional courses in medieval Latin, paleography, and manuscript studies. In addition, students are urged to consult the catalog offerings of other departments or programs of Art History, Celtic Studies, Classics, Comparative Literature, Dramatic Art, English, French, German, History, Italian Studies, Linguistics, Music, Near Eastern Studies, Philosophy, Religious Studies, Rhetoric, Scandinavian, Slavic, and Spanish and Portuguese, as well as in the School of Law and the Graduate Theological Union. An updated list of such offerings is posted each semester on the program website.

Upper Division Courses

150. Studies in Medieval Culture. (2-4) Course may be repeated for credit. One hour of lecture per week per unit. Normally three hours of lecture per week for 15 weeks. In the event that the instructor is in residence for fewer than 15 weeks, the course may be repeated for either 2 or 3 units of credit, in proportion to the number of actual contact hours. Normally taught by the Visiting Distinguished Professor of Medieval Studies. An interdisciplinary exploration of medieval culture, focusing on an area of the instructor’s expertise. Specific topic varies with instructor. (F,SP)

Graduate Courses

200. Introduction to Research Materials and Methods. (4) Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. The graduate proseminar. Basic materials and resources
205. Medieval MSS as Primary Sources. (2) Three hours of seminar per week. Prerequisites: Graduate standing. Taught by the distinguished visiting professor of Medieval Studies on a topic related to his or her specialty. In the event that the instructor is in residence for fewer than 15 weeks, the course will be offered for either 2 or 3 units of credit, in proportion to the number of actual contact hours. (SP)

Microbiology (College of Natural Resources, Interdepartmental Graduate Group)

Course: 111C Koshland Hall, (510) 642-5167
Chair: Tom Bruns, Ph.D.
Professors
Lisa Alvarez-Cohen, Ph.D. (Civil and Environmental Engineering)
Jill Banfield, Ph.D. (Earth and Planetary Sciences/Environmental Science, Policy, and Management)
James Berger, Ph.D. (Molecular and Cell Biology)
Carolyn Bertozzi, Ph.D. (Chemistry/Molecular and Cell Biology)
Michael R. Botchan, Ph.D. (Molecular and Cell Biology)
Thomas D. Brut (Microbial Biotechnology)
Bob B. Buchanan, Ph.D. (Plant and Microbial Biology)
Richard Calendar, Ph.D. (Molecular and Cell Biology)
W. Zachues Cano, Ph.D. (Molecular and Cell Biology/Planet and Microbial Biology)
Douglas S. Jones (Chemical and Biomolecular Engineering)
John Coates, Ph.D. (Plant and Microbial Biology)
Todd Dawson, Ph.D. (Environmental Science, Policy, and Management/Integrative Biology)
Mary K. Firestone, Ph.D. (Environmental Science, Policy, and Management)
Suzanne M. J. Fleiszeg, O.D., Ph.D. (Optometry)
N. Louise Glass, Ph.D. (Plant and Microbial Biology)
Eva Harris, Ph.D. (Plant and Microbial Biology)
Andrew O. Jackson, Ph.D. (Plant and Microbial Biology)
David Jenkins, Ph.D. (Civil and Environmental Engineering)
Jay D. Keasling, Ph.D. (Chemical and Biomolecular Engineering)
Steven E. Lindow, Ph.D. (Plant and Microbial Biology)
Fenyong Lu, Ph.D. (Public Health)
Terry E. March, Ph.D. (Molecular and Cell Biology)
Krishna K. Nyogi, Ph.D. (Plant and Microbial Biology)
Daniel A. Portnoy, Ph.D. (Plant and Microbial Biology)
Leo V. Riley, Ph.D. (Public Health)
Jasper D. Fink-Guyer, Ph.D. (Plant and Cell Biology)
Randy W. Schekman, Ph.D. (Molecular and Cell Biology)
George F. Sensabaugh, D. Cm. (Public Health)
Shauna Senger, Ph.D. (Integrative Biology)
Brian J. Staskawicz, Ph.D. (Plant and Microbial Biology)
Richard S. Stephens, Ph.D. (Public Health)
John W. Taylor, Ph.D. (Plant and Microbial Biology)
Matthew Weiss, Ph.D. (Molecular and Cell Biology)
Patricia C. Zambryski, Ph.D. (Plant and Microbial Biology)
David Zusman, Ph.D. (Plant and Microbial Biology)

Program Director
Michael Shapira, Ph.D. (Integrative Biology)

Associate Professors
Britt A. Gaulsinger, Ph.D. (Plant and Microbial Biology)
Arash Komeili, Ph.D. (Plant and Microbial Biology)
Han Lim, Ph.D. (Integrative Biology/Management)
Kathleen Ryan, Ph.D. (Plant and Microbial Biology)
Mich Tapp, Ph.D. (Plant and Microbial Biology)
Russell Vance, Ph.D. (Molecular and Cell Biology)

Graduate Program in Microbiology

The Graduate Group in Microbiology is composed of 43 faculty from diverse departments, colleges, and schools (Plant and Microbial Biology, Molecular and Cell Biology, Public Health, Civil and Environmental Engineering, Chemical and Biomolecular Engineering, Environmental Science, Policy, and Management; Nutritional Science and Toxicology; Optometry; and Integrative Biology) and is administered by the Department of Plant and Microbial Biology. The group awards the Ph.D. degree in Microbiology. Faculty spans more than one of these categories. In diverse disciplines through an integrated program of study that allows each student to pursue special interests. Students gain a breadth of understanding of the multitudes of levels of organization, as well as the interactions of microbes—beneficial and pathogenic—with other organisms.

The graduate program features an introductory seminar (Faculty Research Review), a two-semester core course, and additional seminars and in areas of faculty specialties. The core course is comprised of six modules that cover the following topics: microbial genetics, genomics and computational biology, microbial diversity and evolution, cell structure and function, microbial physiology, and microbial ecology.

Faculty in the Graduate Group in Microbiology have research interests in four broad areas: ecology and evolution, genetics and development, physiology and biochemistry, and host-microbe interactions. The research of many faculty spans more than one of these categories. In addition, the research goals vary from addressing fundamental questions in biology to applied studies in the control or use of microbes. Some faculty conduct research on both fundamental and applied topics.

Students admitted to the Graduate Group in Microbiology are expected to have a background in chemistry, physics, mathematics, and biology. An admissions committee composed of three to five faculty members and one graduate student will review applications and make recommendations to the full faculty on admissions matters. Recommendations for admission will be based on past achievements in university-level undergraduate and graduate courses, letters of recommendation, written statements of academic and professional goals, and other evidence of academic accomplishment. Scores on standardized tests such as the Graduate Record Examination (GRE), are required of all students. Applicants seeking detailed information about matters such as admission and curriculum should contact the student affairs officer or the graduate adviser.

Middle Eastern Studies (College of Letters and Science)

Group Major Office: International and Area Studies, 121 Stephens Hall, iastp@berkeley.edu, (510) 642-4466
Chair: Anna C. Stancil
Group Major Office: International and Area Studies, 121 Stephens Hall, iastp@berkeley.edu, (510) 642-4466

Program Overview

Since 1981, the interdisciplinary minor in Middle Eastern Studies (MES) has provided Berkeley students with the opportunity to study a region of great historical and cultural importance, whose political, economic, and social development is closely linked to that of our own society. The MES major covers the Arab world, Turkey, Iran, Israel, and Iraq, intertwining history and culture, geography and ecology, politics and economics, with an emphasis on the modern and contemporary Middle East. It is structured in such a way as to offer a wide variety of Middle East-related courses offered by faculty from more than 20 different departments and schools in the University. Students in the MES major also must take at least one course in the major Middle Eastern languages of today: Arabic, Hebrew, Persian, or Turkish. MES graduates have gone on to work in industry and government, both in the United States and abroad. About half pursue graduate studies; many then go on to academic or professional careers.

The MES major falls under the academic supervision of the Center for Middle Eastern Studies. The CMS organizes public lectures, publishes a newsletter, maintains a small library, and promotes scholarship on the Middle East at all levels. Students are encouraged to utilize the Center’s many resources. The MES major is administered through the International and Area Studies (IAS) office. The IAS office provides information on all administrative aspects of the major, including advice on when and how to declare, fulfilling requirements, and timelines for graduation. Academic advising—including planning a course of study to suit individual needs and interests, identifying a thesis topic and adviser, and career counseling—is offered by the MES chair and co-chair.

The MES major should not be confused with the major in Near Eastern studies (NES), which emphasizes language and literature and includes the study of the ancient Near East. Students interested in those fields should contact the Department of Near Eastern Studies in 250 Barrows Hall, (510) 642-3757.

The Group Major

Declaring a major in MES follows guidelines established by the College of Letters and Science. Students wishing to declare Middle Eastern studies:

1. must have completed or be currently enrolled in one course that meets the MES lower division requirement (NES 10, History 12, MES 10) at Berkeley or have completed an equivalent course at another institution. Other courses (listed as having 50% or more Middle Eastern-related content) may be substituted with chair or co-chair approval for the purposes of declaring the major only. The
Lower division requirement must still be met to declare the major, however, and should be taken no later than the following semester.

(2) must have completed or be currently enrolled in a modern Middle Eastern language course (Arabic, Hebrew, Persian, or Turkish);

(3) must have a major and cumulative GPA of 2.0 or higher;

(4) must have attended a major declaration workshop; and

(5) must not be in their final semester of undergraduate work.

Students are reminded that: (1) no coursework for the major may be taken on a passed/not passed basis, and (2) no course may be used to satisfy more than one major requirement.

Applications are available in the IAS office at 101 Stephens Hall. They must be signed by the MES coordinating faculty adviser and returned to the IAS office.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science. No more than two upper division courses may be used to satisfy requirements in both majors.

Courses Outside L&S. No more than three courses outside the College of Letters and Science may be used to fulfill group major requirements.

Study Abroad. The use of coursework taken at institutions outside the United States to fulfill major requirements is restricted to the equivalent of three semesters of upper division courses. Courses taken to fulfill the foreign language requirement for the group major are not included in this restriction. Prior to their departure, students should meet with the MES chair or co-chair to review prospective courses of study.

Transfer Courses. A maximum of three courses taken at other institutions (including those of the UC Education Abroad Program) may be transferred into the major. Relevant courses taken at community colleges can be counted toward the lower division requirement only. Courses from other institutions may be counted toward upper division requirements (regardless of unit value) and must be validated by the Office of Undergraduate Admission and Relations with Schools and approved by the MES chair or co-chair. Courses used to fulfill the foreign language requirement are not included in this restriction.

Lower Division Requirements:

MESA 10, Introduction to the Near East (4 units). A survey course introducing the fundamentals of Middle Eastern civilization presented in a broad historical framework; or

MESA 10, Social Issues in Middle Eastern Studies (4 units). A lower division interdisciplinary course about contemporary social issues relating to the Middle East that treats regional and international questions; or

History 12, Introduction to the Middle East (4 units). A survey of key historical developments from the rise of Islam to the present, including the significant contributions from a world historical perspective, the construction of the modern state system from the late Ottoman era through the period of British and French colonial rule, the newly independent states of the Middle East, and the postcolonial period.

Foreign Language Requirement. All MES students must be able to demonstrate proficiency equivalent to four college-level semesters in a modern Middle Eastern language: Arabic, Hebrew, Persian, or Turkish. The first semester language course must be completed or be in progress at the time of admission to the major. The remaining three courses may be completed at any time before graduation. The language cannot be started in the senior year and finished in the post-graduate summer.

There are three ways students can fulfill the four-semester language requirement, depending on their background and ability:

(1) Through coursework. A combination of college, summer programs, or other approved study abroad programs can satisfy the language requirement. At a minimum, students must complete the fourth semester of a language with a grade of C- or better. The first, second, and third level of language may be taken on a passed/not passed basis; the fourth semester must be taken for a letter grade. Language courses need not be taken at Berkeley; courses taken at a community college or any other university are acceptable.

Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided. See the MES coordinating faculty adviser concerning language study abroad.

(2) With a proficiency examination. Students whose language skills are at a fourth semester or beyond and who do not wish to take language courses can opt to test out of the requirement by requesting a language exam at the time of admission by an appropriate language instructor in the Department of Near Eastern Studies (see language directions in the Department of Near Eastern Studies for certification of knowledge and identification forms and may be obtained through the IAS office. Students whose exams reveal only partial ability to read, write, and converse must take proficiency courses to establish their proficiency level, as determined by the examiner. These courses may be in any of the four Middle Eastern languages. Students who are able to show advanced ability in one Middle Eastern language are encouraged, but not required, to begin study of a second Middle Eastern language.

(3) Being a non-native English speaker. Non-native speakers of English may use their native language to satisfy this requirement. However, documentation of fourth-semester ability is still required. Students may take a proficiency test (see above) or, alternatively, provide documentation that they have been educated in their native language at least through high school.

Upper Division Requirements. There are nine required upper division courses, totaling no fewer than 30 units. They consist of three core courses; four thematic and disciplinary concentration courses; a methods course (MESA 102); and a senior or honors thesis (MESA 190/H195).

Note: With the exception of MESA courses, no more than three courses may be taken from the same department.

Core courses (3 courses). The core course requirement is intended to provide a broad introduction to the Middle East, encompassing geography and ethnography, history and cultures, and current political, economic and social developments. To satisfy this requirement, students must choose from a list of eligible courses (those indicated as having 50% or more Middle East-related content) in three different departments. A list of currently approved core courses may be found in the MES Handbook.

Disciplinary concentration. In addition to the core courses, MES students complete a four-semester disciplinary concentration requirement in which they pursue advanced study of a selected topic in Middle Eastern studies following a particular disciplinary focus. Students must complete three courses (those indicated as having 50% or more Middle East-related content) in three different departments. A list of currently approved core courses may be found in the MES Handbook.

Methods and Scope of Research in Middle Eastern Studies (MESA 102) is offered each fall and provides an introduction to interdisciplinary research strategies for the collection, interpretation, and analysis of data in the field of Middle Eastern studies. The semester's reading and assignments are devoted to two parallel activities: identifying and analyzing different scholarly approaches to select topics in MES and preparing a prospectus on individual thesis topics, the writing of which will take place in MES 190 or H195 under the supervision of an appropriate faculty thesis adviser.

Senior thesis (one course): MESA 190 (4 units). The required senior thesis (a research paper of 30-40 pages) gives students the opportunity to demonstrate their concentration and conduct further advanced research on a topic in Middle Eastern studies. To organize and guide their research and writing, students participate in a tutorial relevant to the topic and enroll in an advanced scholar approved by the MES chair or co-chair. The senior thesis must be completed within one semester. Students are also required to submit a bound copy of the thesis to the Center for Middle Eastern Studies. MESA 190 must be taken for a letter grade.

Senior Honors Program (optional): MESA H195 (4 units). Senior students with a GPA of at least 3.6 in courses for the major and 3.5 in all work completed at Berkeley are eligible to participate in the Senior Honors Program. The program consists of a two-semester sequence: MESA 102 and H195. MESA 102 is a research methods course in which students determine a thesis topic, review the relevant secondary literature, identify primary source materials, and prepare a substantive prospectus. The honors thesis, a research paper of approximately 50-75 pages, is completed in MESA H195 under the direct supervision of a faculty member appropriate to the student's interest. Students must register for both MESA 102 and H195 for a letter grade. A senior honors thesis must be submitted on the date agreed upon between the student and the thesis adviser. A bound copy must also be submitted to the Center for Middle Eastern Studies.

Note: There is no guarantee that students accepted into the Honors Program will graduate with honors. Honors recommendations are made after graduation and are based on a number of factors including, but not limited to, major GPA, grades received for MESA 102 and H195, and faculty advisor recommendations.

Selecting Courses for the MES Major. There are several rules governing course selection for MES. These rules are designed to preserve the character and coherence of the major. Exceptions are rare and can only be approved by the MES chair or co-chair.

MES majors and minors may use any courses listed as having 50% or more Middle East-related content to fulfill their program requirements. No lower division courses can be counted toward MESA 102 and History 12 may be counted toward the major or the minor unless by prior approval of the MES chair or co-chair.

MES majors may also petition to use up to two courses listed at 33% toward their concentration. The second division of the course list may also be included subject to
petition if they have some Middle East-related content. Petitions for courses with 33% Middle East-related content, as well as petitions for courses not on the course list, must consist of: (1) the MES Major Concentration Course Petition and (2) an attached course syllabus with all Middle East-related content highlighted. Petitions must be submitted to the chair. No course with 33% Middle East-related content cannot be used to fulfill core requirements of the major. MES minors must choose courses listed at 50% or more Middle East-related content to complete minor requirements.

Minor in Middle Eastern Studies

The minor in Middle Eastern studies is designed to introduce students to the study of the modern Middle East—understood as comprising the Arab world, Turkey, Iran, and Israel—through social science and humanities courses. Students interested in emphasizing language, archaeology, and/or ancient civilizations should investigate minors in the Department of Near Eastern Studies.) The MES minor is open to all undergraduates with the exception of MES majors. Minor applications must be submitted no later than the last day of registration of the semester immediately preceding the final semester.

MES Minor Course Requirements. One introductory lower division course from the following: MES 10, 20; NES 10; History 12, 18. Three upper division Middle East-related courses selected from the list of core courses. Any substitutions must be pre-approved by the MES coordinating faculty advisor.

The five upper division courses must be taken from at least two different departments. The study of modern Middle Eastern languages is encouraged; however, there is no language requirement for the MES minor, nor do language courses count toward the minor. The six courses taken to satisfy the MES minor must total 22 or more units. All courses must be taken for a letter grade. MES 97, 99, 197, and 199 may not be used to fulfill minor requirements. At least three of the upper division minor courses must be completed at Berkeley. (All transfer courses must be approved by the MES chair or co-chair.) Students must achieve a minimum overall GPA of 2.0 in the courses used to satisfy minor requirements. Only one course may be double-counted with a major program. Coursework for the minor must be completed within the 150-unit maximum for graduation. For further information, see the MES minor information sheet, pre-approved course list, and application available in 101 Stephens Hall.

Lower Division Courses

29. Perspectives on the Middle East. (2) Two hours of seminar per week. A weekly seminar including guest speakers on: (1) ethnic perspectives (Persians, Arabs, Turks, Israelis); (2) religious perspectives (Islam, Christianity, Judaism); and (3) disciplinary perspectives (anthropology, sociology, etc.). The seminar introduces students to the work of several major Berkeley Middle East scholars. The class has no prerequisites. Course credit is given to lower division students and prospective Middle Eastern majors. (SP)

49. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Section 3 to be graded on a pass/fail basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. (F,SP) Staff

98. Directed Group Study for Lower Division Students. (1-4) Course may be repeated for credit with different instructor. One to four hours of directed group study, must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. The student is supervised by a faculty member appropriate to the student’s interest. (F,SP)

Upper Division Courses

102. Scope and Methods of Research in Middle Eastern Studies. (4) Students will receive no credit for 102 after taking Political Economy 102, or International and Area Studies 120 or 118. Three hours of lecture per week. Prerequisites: Upper division standing. Required for all students majoring in Middle Eastern studies, open to all students in International and Area Studies Teaching Program focusing on the Middle East interdisciplinary research strategies for the collection, interpretation, and analysis of data. Course integrates the study of the fundamental theories of social science, with the practical techniques of social science research methods. (F,SP) Gottehrer

109. Model Arab League. (3) Two hours of lecture per week, plus participation in the Model Arab League simulation. Required for all students majoring in Middle Eastern studies, open to all students in International and Area Studies Teaching Program focusing on the Middle East interdisciplinary research strategies for the collection, interpretation, and analysis of data. Course integrates the study of the fundamental theories of social science, with the practical techniques of social science research methods. (F,SP) Gottreich

150. Advanced Study in the Middle East. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instructor. This course will include Moderate cross-listed courses offered through other departments, the content of which is applicable to Middle Eastern Studies majors. Content and unit values vary from course to course. (F,SP)

190. Senior Thesis. (1-4) Individual conferences. Prerequisites: Upper division standing in the major, at least 15 upper division units in the major, Near Eastern Studies 10. With the guidance of a faculty member of the program, the preparation and presentation of a senior thesis pertaining to the student’s individual area of concentration within the Middle Eastern studies major. Final paper required. Units determined on consultation with instructor. (F,SP)

H195B. Honors in Middle Eastern Studies. (4) Weekly consultation with faculty thesis adviser. Prerequisites: Open to all students. This is the second of a two-semester honors program and culminates in the completion of a senior thesis. The thesis project begins with H195A, which must be successfully completed before entering the thesis writing seminar. During this semester, an honors thesis of approximately 50-75 pages is completed under the direct supervision of the instructor of the honors seminar program in international and area studies and a faculty member appropriate to the student’s area of research. (F,SP)

H195A. Honors in Middle Eastern Studies. (4) Weekly consultation with faculty thesis adviser. The senior honors is a two-semester program. The thesis project begins with H195A. This semester consists of a research methods course in which students determine a thesis topic, review the relevant secondary literature, identify primary source materials, and prepare a substantive prospectus. The senior honors thesis is completed in the second semester of the program in H195B. Students intending on enrolling in 190, Senior Thesis, may take this course as well. (F,SP)

Military Officers’ Education Program (ROTC) (Special Courses)

Military Officers’ Education Program (ROTC)

Office: See following listings for Aerospace Studies, Military Science, and Naval Sciences
Chair: Advisory Committee on ROTC: Prof. Philip T. Spiehl

Adjunct Professors
Jonathan Nejin, M.A. (Lieutenant Colonel, U.S. Army)
Philip H. Roos, M.A. (Captain, U.S. Navy)
Brian E. Stone, M.S. (Lieutenant Colonel, U.S. Air Force)

Adjunct Associate Professor
Jonathan M. Fennor, M.A. (Lieutenant Colonel, U.S. Marine Corps)

Adjunct Assistant Professors
Brent L. Barnes, M.Ed. (Captain, U.S. Army)
Dee Hyun Gillespie, B.S. (Lieutenant Colonel, U.S. Army)
Charles R. Rice, M.A. (Captain, U.S. Air Force)
Jason L. Sadowski, M.S. (Lieutenant Colonel, U.S. Navy)
Christopher Zundel, M.S. (Lieutenant, U.S. Navy)

Lecturer
Kathryn T. Sharp, B.S. (Captain, U.S. Air Force)

Program Overview

The Military Affairs Program, within the Division of Undergraduate and Interdisciplinary Studies (UGIS), comprises three distinct military officers’ commissions: University Army ROTC, Navy ROTC, and Naval ROTC. The purpose of the program is to integrate the educational offerings of the separate military services into the regular University curriculum. In performing academic functions, the Military Affairs unit operates under the same as any other program within UGIS. Its military faculty members, though nominated by the three military services, are subject to the same selection process as other Berkeley faculty members, and the Academic Senate’s Committee on Courses must approve its curriculum. Military affairs courses are open to all Berkeley students as well as to students from other East Coast colleges under cross-enrollment agreements or through UC Berkeley Extension.

Students interested in the Military Officers Education Program should visit military.berkeley.edu or contact the program advisors in the appropriate unit:
Military Affairs

Lower Division Courses

1. Military Physical Fitness and Nutrition. (1) Three hours of physical training per week. Prerequisites: Consent of instructor. This course teaches the fundamentals of physical fitness and nutrition employed by the U.S. military to condition ROTC cadets for the physical demands they will face as military officers. The course includes nutrition, physical fitness program development, phases of conditioning, environmental factors and nutrition. Physical training will include, but is not limited to, running up to five miles, foot marches up to six miles with a pack, swimming, team sports, weight training, aerobics, and other activities designed to develop an individual’s components of fitness, teamwork, and aggressive competitive qualities. (F,SP)

20. Evolution of Warfare. (3) Three hours of lecture per week. Progressive analysis of the evolution of warfare from very early times to the present. Emphasis is placed on causes of continuity and/or change of methods, as well as the influence of economic, moral, political, and technological factors on strategic thought. (SP)

Upper Division Courses

123. Korea, Vietnam and the American Military Experience. (3) Three hours of lecture per week. This course examines recent military experience of the United States in terms of the traditional American way of preparing for and waging war with emphasis on the strategy and tactics used in the Korean and Vietnam Wars. (F)

145A. National Security Forces in Contemporary American Society. (3) Three hours of seminar per week. Prerequisites: Upper division standing and consent of instructor. Conceptually examines the Armed Forces and implementation of American society. Examines contemporary issues in civil-military relations and the national and international environment in which U.S. defense policy is formulated and implemented. (F)

145B. Preparation for Active Duty. (3) Three hours of lecture and four credits only, a two-hour advanced leadership laboratory per week. Prerequisites: Upper division standing and consent of instructor. This course focuses on commissioning of cadets and their transition to active duty. The primary focus of instruction is officerhood, professionalism, and leadership, topics specific for specific discusson include the military justice system, military ethics, core values, military professionalism, and current issues affecting the Air Force. This is a general introduction to basic functions designed to ease cadets’ transition to active duty. This course combines lecture and discussion with increased emphasis on the students’ written and oral communication skills. (SP)

154. The History of Littoral Warfare. (3) Three hours of lecture per week. An analysis of the theory, origins, historical evolution, and impact of man’s attempts to project seapower ashore. A case study approach is used to study major doctrine and operations in amphibious warfare. (F)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conference to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised independent study and research for undergraduate students who desire to pursue topics of their own selection. (F,SP)

Aerospace Studies (Air Force ROTC)

Department Office: 176 Hearst Gymnasium, (510) 642-3572
airforcerotc.berkeley.edu

The Department of Aerospace Studies offers students in virtually all academic areas the opportunity to qualify for a commission in the United States Air Force. Students concurrently enrolled as university graduate and undergraduate degree requirements. Eligible students must have at least two full academic years remaining in their bachelor’s or graduate program. Students interested in the general military course may still be eligible for the two-year professional officer course. This upper division program is open to students who have at least two full years of study remaining in their academic program. Selection for the professional officer course is based on such factors as aptitude, interest, college grades, and personal and professional qualities. Students selected for the professional officer course are provided uniforms, textbooks, and a $350-500 per-month allowance, while they are actively on the program. Normal upper division standing is required to enter the two-year program, but exceptions can be made for lower division students who can complete degree requirements in two years. It is also possible to take all or part of the professional officer course as a graduate student.

Both the two- and the four-year AFROTC programs emphasize student participation and involvement. Classes are conducted as seminars and courses allow students a two-week field training camp. Students selected for the professional officer course are provided uniforms, textbooks, and a $350-500 per-month allowance, while they are actively on the program. Normal upper division standing is required to enter the two-year program, but exceptions can be made for lower division students who can complete degree requirements in two years. It is also possible to take all or part of the professional officer course as a graduate student.

Aerospace studies courses are open to all University students. Students from other institutions may participate in the AFROTC program through cross-enrollment arrangements or through UC Berkeley Extension. For further information on enrollment requirements and procedures, contact the department staff at (510) 642-3572.

Lower Division Courses

1A. Foundations of the U.S. Air Force. (1) One and one-half hours of lecture/discussion per week. For- merly 1. Introductory survey of the U.S. Air Force. Explores the history, social, economic, and political aspects of the service. (F)

1B. Foundations of the U.S. Air Force. (1) One and one-half hours of lecture/discussion per week. A survey course designed to introduce cadets to the U.S. Air Force and the Air Force Officer Training Corps (AFROTC). Featured topics include Air Force core values, leadership, team building, diversity, and communication skills. Additionally, AFROTC cadets must attend weekly Leadership Lab. Leadership Lab is a weekly laboratory that touches on the topics of Air Force customs and courtesies, health and physical fitness, and drills and ceremonies. (F,SP)

2A. The Evolution of U.S. Air Force Air and Space Power. (1) Course may be repeated for credit. Two hours of lecture per week. Formerly 2F. This course is designed to examine the general aspects of air and space power through a historical perspective. Utilizing this perspective, the course covers a time period from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples are provided to extrapolate the development of Air Force capabilities (competencies) and limitations (functions) to the current state of evolution of what has become today’s air and space power. (F)

2B. The Evolution of U.S. Air Force Air and Space Power. (1) One hour of lecture per week. This course is designed to examine the general aspects of air and space power through a historical perspective. It examines the fundamentals of leadership associated with war in the third dimension; e.g., principles of war and tenets of air and space power. As a whole, this course provides students with a knowledge-level understanding for the element and effect of air and space power, from an institutional, doctrinal, and historical perspective. (SP)

Upper Division Courses

100. Leadership Laboratory. For Air Force cadets only. Two hours of laboratory per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. This course is a study of leadership, management fundamentals, professional knowledge, and communication skills required of an Air Force junior officer. Lecture, text, case studies, and class discussion will be used to examine all aspects of leadership including counseling, mentoring, empowering, problem solving, accountability and authority. Students will develop upon basic written and oral communications skills primarily through written assignments and oral presentations. (F,SP)

135A-135B. Air Force Leadership Studies. (3;3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course is a study of leadership, management fundamentals, professional knowledge, and communication skills required of an Air Force junior officer. Lecture, text, case studies, and class discussion will be used to examine all aspects of leadership including counseling, mentoring, empowering, problem solving, accountability and authority. Students will develop upon basic written and oral communications skills primarily through written assignments and oral presentations. (F)

442. Light Aircraft Operations. (3) Three hours of lecture per week. This course prepares students to take the Federal Aviation Administration Private Pilot Knowledge Exam. Topics of study include the principles of flight, federal aeronautics, the flight environment, aircraft systems and performance, basic meteorology, navigation, aviation physiology, and comprehensive flight planning. (SP)
Students must also be academic juniors or higher with at least two academic years left until completion of their degree, when they enter the Advanced Course.

Financial Assistance and Scholarships. All advanced courses receive at least $350 (juniors) or $400 (seniors) monthly (non-taxable) for up to 10 months a year. Students may compete for two-, three-, or four-year ROTC scholarships. On the need not leadership, the program to compete for a ROTC scholarship. A scholarship includes money to cover tuition and fees, which can be used instead toward campus room and board. Authorized tuition and fees; an annual textbook allowance of $900; and a monthly stipend. Advanced-course scholarship students go on to receive a commission as an officer in the military for at least eight years, either on active duty or in the Army National Guard or Reserves, or a combination of the two.

Military science courses are open to all University students. Students from other area institutions may participate in the Army ROTC program through cross-enrollment arrangements or through UC Berkeley Extension.

For more information concerning Army ROTC or the Department of Military Science, contact the staff at Hearst Gymnasium or call (510) 642-3374.

**Lower Division Courses**

1. Leadership Laboratory. The laboratory may be taken for eight semesters. Two hours of instruction and practical application are designed for the core leadership course. This course is structured in modules. There are six modules, as follows:

   - Module 1—The Army Profession: Officership. (What is an officer's role within the Army and to lay the foundation for leadership skills, and support the beginning of the final year place cadets to attain knowledge and proficiency in several critical areas that they will need to operate effectively as an Army officer, including the Army's training management system, coordinating activities with staff, and individual counseling skills. At the end of the semester, students should possess the fundamental skills, attributes, and abilities to operate as competent leaders and confidently shoulder the responsibilities entrusted to them. This course is structured in modules. There are six modules, as follows:

2. Foundations of Officership. (1) One hour of lecture/discussion per week. This course examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). This course highlights dimensions of terrain analysis, patrolling, and operation orders. Further study of the theoretical basis of the Army Leadership Requirement Model explores the dynamics of adaptive leadership in the context of military operations. (SP) Barnes

   - Module 1—The Army Profession: Officership. (2) Introduction to Tactical Leadership. (1) One hour of lecture/discussion per week. This course overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Students will explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises. (SP) Barnes

   - Module 2—Personal Development. (3) Leadership and Management. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course explores the dynamics of leadership in the complex situations of contemporary military operations in the contemporary operating environment (COE). Students will examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism. Students also explore aspects of interacting with non-government organizations, civilians on the battlefield, and host nation support. (SP) Barnes

   - Module 3—Physical Well-Being. (3) Physical fitness, stress management. (F)

   - Module 4—Leadership. (definition, AOR model, Army Be-Know-Do-model, character, and competence).

   - Module 5—Values and Ethics (morals versus ethics, ethical decision making, Army (Institutional) Values). (F)

3. Introduction to Tactical Leadership. (1) One hour of lecture/discussion per week. This course overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Students will explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises. (SP) Barnes

   - Module 1—The Army Profession: Officership. (2) Introduction to Tactical Leadership. (1) One hour of lecture/discussion per week. This course overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Students will explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises. (SP) Barnes

   - Module 2—Personal Development. (3) Leadership and Management. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course explores the dynamics of leadership in the complex situations of contemporary military operations in the contemporary operating environment (COE). Students will examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism. Students also explore aspects of interacting with non-government organizations, civilians on the battlefield, and host nation support. (SP) Barnes

   - Module 3—Physical Well-Being. (3) Physical fitness, stress management. (F)

   - Module 4—Leadership. (definition, AOR model, Army Be-Know-Do-model, character, and competence).

   - Module 5—Values and Ethics (morals versus ethics, ethical decision making, Army (Institutional) Values). (F)

   - Module 6—Leadership. (F)

142. Leadership in a Complex World. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course explores the dynamics of leadership in the complex situations of contemporary military operations in the contemporary operating environment (COE). Students will examine differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism. Students also explore aspects of interacting with non-government organizations, civilians on the battlefield, and host nation support. (SP) Barnes

**Professional Courses**

431. Applied Team Leadership. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course is an academically challenging course where you will study, practice, and apply the fundamentals of Army leadership, officership, army values and ethics, personal development, and small unit tactics at the team and squad level. (SP) Barnes

432. Leadership and Ethics. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course examines the role communication, values, and ethics play in effective leadership. Topics covered include ethical decision making, consideration of others, spirituality in the military, and a survey Army leadership doctrine. There is also added emphasis on improving each student's oral and written communication abilities. (F,SP) Barnes
Naval Science (Naval ROTC)

Department Office: 152 Hearst Gymnasium, (510) 642-3551

The Department of Naval Science offers several programs of instruction for men and women leading to commissions in the U.S. Navy or U.S. Marine Corps. Naval science courses are open to all university students or may be taken through UC Berkeley Extension.

Students enrolled in one of the four-year Naval ROTC programs will normally complete the following courses during their first two years as part of their overall academic load: NS 1, 2, 3, and 10. Navy Option students enrolled in either the four- or two-year option, will normally complete the following courses during their junior and senior years: NS 12A, 12B, 401, and 412. Marine Option students will participate in a Marine seminar and complete the History of Warfare (MA 134) and an Evolution of Warfare (MA 20). All Navy Option scholarship students must complete one year of calculus and one year of calculus-based physics by the end of their sophomore and junior years respectively.

Students are also required to attend weekly professional development laboratories. These three-hour sessions offer the student midshipman an active role in the management and direction of the marine seminar and provide time for the midshipmen to explore professional topics. Student midshipmen participate in four- to six-week summer training cruises throughout the world. At sea, they apply theoretical aspects of their education and training to the real world environment of a Navy ship. Marine Option midshipmen attend Marine Corps Officer Candidates School in the summer between their junior and senior years.

Currently, there are five programs available:

1. NROTC Four-Year Scholarship Program. This program is open to physically qualified men and women between the ages of 17 and 21 with waivers available for prior active duty to maximum commissioning year age of 29. U.S. citizenship is required. High school seniors and college freshmen are eligible to apply. Successful applicants receive full payment of tuition, fees, books, and $250-$400 per month during the school year, respectively. One summer training cruise is required. Upon graduation, the student receives a commission in the Naval or Marine Corps with a three-year active duty obligation. Application deadline is normally March 1 of the sophomore year.

2. Tweeddale Scholarship Program. This program provides NROTC Navy scholarship benefits specifically for men who are affiliated with an engineering/technical discipline program or who are members of an underrepresented minority group. Applicants cannot have been affiliated with NROTC or any other officer accession program. Students must be currently enrolled and must have completed one college-level mathematics course and one semester/year of college coursework with all course grades of C or better. These scholarships can be conditionally granted by the Professor of Naval Science at 152 Hearst Gymnasium following an interview and screening process. Accepted applicants must meet NROTC physical qualification standards and will be required to take naval science courses. For additional details, call (510) 642-3551.

3. NROTC Four-Year College Program. Open to physically qualified men and women between the ages of 17 and 21 with the same active duty age waiver possible as above. Participants receive uniforms, naval science books, and a $350- and $400-per-month stipend in their junior and senior years, respectively. They complete one summer training cruise after their junior year. Upon graduation, the student receives a commission in the Navy or Marine Corps Reserve with a three-year active duty obligation, (Obligated service of six years is incurred until the start of the junior year in the four-year college program.) Scholarships may be offered to highly qualified college program students.

4. NROTC Two-Year Scholarship Program. National and Navy Option students go to a physically qualified and academically qualified midshipmen and women who will be entering their junior year (or their third year in a five-year curriculum). U.S. citizenship is required. Two-year option students are only eligible for the entrance year of NROTC. Two-year option students must not reach their 25th birthday before June 30 of the year in which graduation and commissioning requirements can be fulfilled. Two-year option students are not eligible for prior service. Candidates for the two-year scholarship attend a six-week training period at the Naval Science Institute in Newport, Rhode Island, before the start of their junior year. Graduates of the naval science Institute will receive full payment of tuition, fees, books, and a $350- and $400-per-month stipend during their junior and senior years, respectively. One summer training cruise is required. Upon graduation, the student receives a commission in the Navy or Marine Corps with a four-year active duty obligation. Application deadline is normally March 1 of the sophomore year.

5. NROTC Two-Year College Program. Open to physically and academically qualified men and women who will be entering their junior year of undergraduate study (or their third year in a five-year curriculum). The age limit is the same as above. U.S. citizenship is required. Candidates attend the Naval Science Institute in Newport, Rhode Island, during the summer before their junior year. Students are required to enroll in the NROTC unit as juniors and receive uniforms, naval science books, and a $350- and $400-per-month stipend in their junior and senior years, respectively. One summer training cruise is required. Upon graduation, the student receives a commission in the Naval or Marine Corps with a three-year active duty obligation. Application deadline is normally March 1 of the sophomore year.

For further information, call (510) 642-3551.

Lower Division Courses

1. Introduction to Naval Science. (2) Three hours of lecture for 10 weeks. This course provides an overview of the missions and organization of the Department of Defense and the naval service, the long-held customs and traditions of the service, basic leadership, ethics and character development, the principles of sea power, and basic information concerning shipboard procedures and safety. It is the intent of this course to stimulate the students’ interest for study and investigation in future courses. (F)

2. Sea Power and Maritime Affairs. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. This course is designed to develop the students’ conceptual understanding of sea power and its role in national security. This course meets the sea power requirement. (SP)

3. Leadership and Management I. (3) Three hours of lecture/discussion/seminar per week. This course will cover basic management, decision making, and moral leadership. The student will learn to establish meaningful goals, prioritize among competing demands, develop plans and organize their work, and take action. The course includes exposure to measures of organizational effectiveness, methods to overcome resistance to change, effective communications, and leadership techniques to manage, motivate, and resolve conflict and interpersonal matters.

4. Naval Ship Systems I. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Mathematics 1A or 16A. Principles of ship systems. Emphasis on description and analysis of major types of propulsion plants, both conventional and nuclear. Principles of thermodynamic cycles, electrical theory, propulsion generation and machinery systems. Ship construction, strength and stability in intact and damaged conditions. Factors and design criteria for seaworthiness, structural integrity, and operational employment. (SP)

5. Naval Ship Systems II. (3) Three hours of lecture and one hour of laboratory per week. Prerequisites: 1A or consent of instructor. Introduction to the various aspects of ship operations at sea. Principles of terrestrial navigation including the rules of the road for prevention of collisions at sea, vector and related mathematics and characteristics in maneuvering, precise ship positioning, use of aids to navigation, meteorology, and electronic navigation. (SP)

6. Freshman Seminars. (1) Course may be repeated for credit with topic varying by semester per week. The Freshman Seminar Program is designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-class setting. Freshman seminars are offered in a variety of topics and topics vary from department to department and semester to semester. (F,SP)

Professional Courses

400A-400B. Naval Laboratory. Three hours of instruction and practical application in leadership and associated military skills. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Emphasis is placed on professional training not of an academic nature. The laboratory is intended for topics such as drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, sail training, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, communications, navy, and military justice. Other topics and special briefings will be conducted as determined by the Chief of Naval Education and Training or the Professor of Naval Science. (F,SP)

400D-400E. Naval Laboratory. Three hours of instruction and practical application in leadership and associated military skills. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Emphasis is placed on professional training not of an academic nature. The laboratory is intended for topics such as drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, sail training, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, communications, navy, and military justice. Other topics and special briefings will be conducted as determined by the Chief of Naval Education and Training or the Professor of Naval Science. (F,SP)

401. Naval Ship Systems II. (3) Three hours of lecture per week. An introduction to the physical theory of acoustic and electromagnetic wave generation and propagation; the design and use of electronic, electromechanical, and pneumatic systems; and the components and operation of ships. Examination and analysis of objects sharing and traversing common environments. (F)

412. Leadership and Ethics. (3) Three hours of lecture/discussion/seminar per week. Prerequisites: Consent of instructor. This course is the capstone
Molecular and Biochemical Nutrition (College of Natural Resources, Interdepartmental Graduate Groups)

Office: 117 Morgan Hall, (510) 643-2863
mrt.berkeley.edu/mtnl.html

Chair: Joseph Napoli, Ph.D.

Professors

Bruce N. Ames, Ph.D. (Molecular and Cellular Biology)
Leonard S. Helfer, Ph.D. (Nutritional Science and Toxicology)
Ronald M. Krauss, M.D.
Christopher Vulpe, Ph.D.
Andreas Stahl, Ph.D.
Nancy K. Amy, Ph.D.
Joseph L. Napoli, Ph.D.
George W. Chang, Ph.D.
W. Zacheus Cande, Ph.D.
Kathleen Collins, Ph.D.
Isao Kubo, Ph.D.
Biochemical Nutrition

Molecular and

Cell Biology

(Office of Degree and Letter)

Department: 497 Life Sciences Addition

Graduate Affairs Office: 299 Life Sciences Addition

Chairs: G. Steven Martin, Ph.D., and Michael Botchin, Ph.D.

Professors

Thomas C. Alber, Ph.D. Massachusetts Institute of Technology. Structure/function correlates in tuberculosis, ureaplasma recognition and signaling.

Bruce N. Ames, Ph.D. California Institute of Technology. Mechanisms of aging. mitochondrial decay in aging, oxidoants and antioxidants in DNA damage, micronutrient dependencies, DNA damage, chronic inflammation, and cancer.

George J. Berenson, Ph.D. Harvard University. Structural and mechanistic biochemistry of macromolecular assemblies and machines that regulate the initiation of DNA replication, chromosome, and superstructure.

Carolyn Bertozzi, Ph.D. Stanford University. Chemistry and metabolism. The group's faculty come from molecules and cells to laboratory animals, interaction of nutrition and metabolism. Graduate students are trained in the art of leadership and the technical aspects of interdisciplinary research. The course is divided between the theoretical and practical aspects of a diverse work force, often under circumstances of substantial stress. The course is focused on the structural and functional analysis of biological systems.

Mary L. Fantone, Ph.D. University of California, Los Angeles. Actin and microtubule cytoskeletons in yeast and mammalian cells.

Pete H. Duesberg, Ph.D. University of California, San Francisco. Actin and microtubule cytoskeletons in yeast and mammalian cells.

John G. Forster, Ph.D. University of California, San Francisco. Actin and microtubule cytoskeletons in yeast and mammalian cells.

John G. Flannery, Ph.D. University of California, Santa Barbara. Developmental biology.


Sharon L. Amacher, Ph.D. University of California, San Francisco. Developmental biology.


Mary Mead, Ph.D. (Nutritional Science and Toxicology)

Mary Mead, M.Ed. (Nutritional Science and Toxicology)

Program Overview

The Graduate Group in Molecular and Biochemical Nutrition (formerly the Graduate Group in Nutrition) offers a degree program that focuses on the interaction of nutrition and metabolism. Graduate research may be focused at any level of integration from molecules and cells to laboratory animals and humans. The program has special strengths in cellular and molecular nutrition and in human nutrition and metabolism. The group’s faculty come from a variety of departments at Berkeley including Nutritional Sciences and Toxicology, Molecular and Cell Biology, and additional adjunct faculty from Children’s Hospital Oakland Research Institute are also part of the group.

For admission to the Ph.D. program, students should have a bachelor's degree or its equivalent in nutritional sciences or related fields, including biochemistry and molecular biology, or any of the biological sciences. Candidates for the Ph.D. degree are required to complete a sequence of core graduate nutrition courses and the Ph.D. oral qualifying examination. In addition, all students in the group gain experience in teaching through their service as a graduate student instruc-

Molecular and Cell Biology (College of Letters and Science)

John Ngai, Ph.D. California Institute of Technology. Molecular and cellular mechanisms of olfaction.

Hiroshi Nakanishi, M.D., Ph.D. Keio University. Membrane biochemistry; bacterial physiology.

Elke Evers, Ph.D. University of Kiel. Structure-function of macromolecular assemblies: cytoskeleton self-assembly and molecular and cellular processes.

George F. Oster, Ph.D. Columbia University. Mathematical modeling of molecular, cellular, and developmental systems.

Lior Pachter, Ph.D. Massachusetts Institute of Technology. Computational genome analysis.

Nipam Patel, Ph.D. Stanford University. Genetic and evolutionary studies of embryonic patterning and morphogenesis.

Mu-ming Poo, Ph.D. Johns Hopkins University. Neurobiology.

Daniel A. Portnoy, Ph.D. University of Washington. Molecular and cellular basis of microbial pathogenesis.

David Ruelat, Ph.D. Massachusetts Institute of Technology. Cell biology; tumor virology.

Charles S. Rosen, Ph.D. Cornell University. Collective phenomena and ordering in conditioned matter and biological systems.

K. Schachman, Ph.D. Princeton University. Physical biochemistry.

Wendy R. Scheinberg, Ph.D. Stanford University. Organelle assembly; protein transport.

Mark S. Skolnick, M.B., Ch.B. Johns Hopkins University. Regulation of lymphocyte development, genetic transcription, chromatin structure, and VDJ recombination, origins of acute leukemia.

Nitham Swedner, Ph.D. All Children's Hospital. Molecular and Medical Sciences, New Delhi. Mechanisms of immune surveillance.

Jerome Thomer, Ph.D. Harvard University. Signaling transduction mechanisms, cellular signaling.

Ron Tjian, Ph.D. University of California, Berkeley. Deflated determination in the T-lymphocyte lineage.

Daniel S. Rokhsar, Ph.D. Cornell University. Collective phenomena and ordering in conditioned matter and biological systems.


Nancy A. Weisblat, Ph.D. California Institute of Technology. Developmental biology.

Matthew Welch, Ph.D. University of California, Berkeley. The role of the actin cytoskeleton in cell locomotion.

Frank S. Weinberg, Ph.D. Johns Hopkins University. Neurophysiology of vision.

Gerald Westheimer, Ph.D., F.R.S. Ohio State University. Neurobiology; psychophysics.

Fred H. West, Ph.D. Johns Hopkins University. Molecular embryology.

Astar Wirostko, Ph.D. California Institute of Technology. Signal transduction, apoptosis, autoimmunity, and immune gene regulation.

Chang Liu, Ph.D. University of California, Los Angeles. Biochemistry of HIV gene expression and transcriptional elongation.

Donald A. Glaser, M.D. (Emeritus)

Robert M. Glaeser, M.D. (Emeritus)

Mary Beth Burnside, M.D. (Emeritus)

Jacob L. Ballou, Ph.D. (Emeritus)

M.D. (Emeritus)

C. Fall・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・
successful in entering graduate or medical school and in other science- and health-related careers. Details on the MCB major, its requirements and policies, as well as resources for students, are available in the MCB Undergraduate Affairs office, 2083 Valley Life Sciences Building, or at mcb.berkeley.edu/undergrad.

Lower Division Requirements:
For all but BMB Biological Chemistry: Math 1A-1B; Chemistry 1A (or Chemistry 4A), 3A/AL-3B/BL; Biology 1A/1AL-1B; and Physics 8A-8B (or Physics 7A-7B). Total lower division units: 39.

For BMB Biological Chemistry: Math 1A-1B; Chemistry 1A-1B (or Chemistry 4A-4B); Biology 1A/1AL-1B; and Physics 8A-8B (or Physics 7A-7B). Total lower division units: 33. (Note: BMB biological chemistry requirement is 112A-112B in place of Chemistry 3A/3B/BL.)

Upper Division Requirements:
For Biochemistry and Molecular Biology (BMB): MCB C100A, 100B, 110L, 140/C148; BMB elective.

For BMB Biological Chemistry: Chemistry 112A-112B, 130B, 135; MCB C100A, 110L, 130A/140.

For Cell and Developmental Biology (CDB): MCB 102, 104, 136/130A, 133L; and two CDB electives.

For Genetics, Genomics, and Development (GG&D): MCB C100A, 110, 140, 140L; GG&D elective A/B and elective B.

For Developmental Genetics: MCB 102, 104, 141, 140L; GG&D elective A/B and elective B.

For Immunology and Pathogenesis (IM&P): MCB C100A, 110, 140/150, 150L; IM&P elective.

For Infectious Disease (IM&I): MCB 102, 104, 150L; IM&I elective A and elective B.

For Neurobiology: MCB 102, 104, 160L/163; NEURO elective A/B and elective B.

Honors Program.
The MCB Honors Program offers exceptional senior students recognition for outstanding academic achievement and the opportunity to conduct original research under the guidance of an MCB faculty member. To graduate with honors in the major, students must: (1) complete at least two semesters of research including 4 to 8 units of MCB H196; (2) have a cumulative Berkeley GPA of at least 3.3 in all work completed at Berkeley; (3) have at least 3.5 GPA in all MCB major requirements, or 3.5 in all upper division requirements. Students must also present their research in an approved forum, such as an MCB symposium, the Undergraduate Poster Session, or other scientific meeting; and (5) write an honors thesis. For more information, visit mcb.berkeley.edu.

Graduate Program.
The department offers a program of graduate study leading to the Ph.D. in molecular and cell biology. This program provides advanced training in the research activities and interests of the study of the molecular structures and processes of cellular life. The training is intellectually focused, but at the same time offers unusually wide opportunities for varied specialization. Undergraduate preparation for admission to the program should correspond to one of the two plans of the undergraduate major detailed above. All students working for the Ph.D. will be required to serve as a teaching assistant for two semesters during the first three years. Students seeking detailed information about such matters as admissions, curriculum, and sources of financial support should visit mcb.berkeley.edu or contact the Department at Graduate Affairs office, Department of Molecular and Cell Biology, University of California, Berkeley, 299 Life Sciences Addition #3200, Berkeley, CA 94720-3200; or mcb@berkeley.edu

Research Facilities.
Cancer Research Laboratory is a research institute on the Berkeley campus that carries on a research, teaching, and service program designed to foster interdisciplinary participation in cancer research. Some of the Department of Molecular and Cell Biology faculty are also members of the Cancer Research Laboratory. The central research program represents a multidisciplinary approach to the understanding of the mechanism of neoplastic transformation using a variety of systems. Graduate student and postdoctoral research programs are supported in various areas of tumor biology, biochemistry, cell biology, endocrinology, genetics, immunology, molecular biology, and tumor virology. The Cancer Research Laboratory also operates five research facilities: (1) Flow Cytometry Facility for fluorescence activated cell sorting and analysis; (2) Molecular Imaging Facility with two-photon microscopes for image analysis; (3) Proteomic Mass Spectrometry Facility; (4) Immunology DNA Microarray Consortium; and (5) Gene Tar- geting Facility for conditional and chimeric mice. Instrumentation in the facilities is operated by highly trained staff, and training is offered in methods and techniques associated with each facility. For more information, visit biology.berkeley.edu/crl.

Functional Genomics Laboratory at Berkeley was established to allow Berkeley scientists to exploit profound technological advances in the field of genomics. These advances, which include the sequencing of entire genomes of selected model systems and the ability to survey genome-wide patterns of gene expression, now allow the dissection of biological processes at unprecedented levels of detail. The Functional Genomics Laboratory provides the infrastructure, technologies, and computational resources for the performance of DNA microarray experiments, which allow the analysis of mRNA expression from tens of thousands of genes at a time. The Functional Genomics Laboratory currently possesses all the equipment necessary for conducting DNA microarray experiments, including thermal cyclers, fluo- rides robots, microarray printing robots, laser scanning microscopes for microarray scanning, an Affymetrix workstation and scanner, and a dedicated computer for storage of large scale informatics databases. For more information, visit microarrays.berkeley.edu.

Robert D. Ogg Electron Microscope Labora- tory is an instructional and research unit of the College of Letters and Science. It houses equipment for transmission electron microsopy (TEM) and scanning electron microscopy (SEM). The staff is skilled not only in the operation and maintenance of instruments but in standard and specialized techniques of sample preparation. Qualified undergraduates and graduate students, postdoctoral associates, faculty, and research staff in biological and physical sciences, once trained, may use the equipment for research in their own projects. Nominal charges are made for use of the laboratory for individual research work. With permission from the director, non-UC personnel can be accepted for training or laboratory use. Equipment can be used outside normal hours. The laboratory provides demonstrations of the electron microscope and preparative techniques for undergraduate and graduate students and makes special arrangements for four groups. For more information, visit biology.berkeley.edu/EML.

Other specialized research facilities include those for X-ray crystallography, nuclear magnetic reso
nance studies, large-scale fermentation, tissue culture, and DNA sequencing.

Berkeley Screening Center is a campuswide facility enabling Berkeley researchers to perform high-throughput genetic and chemical screens. BSC provides automation, including automated image-acquisition, microscopy, and high-throughput liquid handling technology; supports for screen execution and analysis; bioinformatic tools; and siRNA libraries. Collaborators, and animals (vertebrates and invertebrates, human genomes, kinomes, and ubiquitinomes. For more information, visit bsc.berkeley.edu.

Division of Biochemistry and Molecular Biology

Lower Division Courses

11A. Of Molecules and Man: A View for the Layman. (3) Students will receive no credit for 11 after taking Biology 11A, Chemistry 3A-3B, 10 or 112A-112B, 112H. Three hours of lecture and one hour of discussion per week. Examination of molecular mechanisms that underlie normal functions of living organisms and ways in which those functions are disrupted by medical disorders and environmental agents. Designed to provide non-biologists with an understanding of modern biochemistry and the ways we control and alter the biology of our life and environment. (SP) Aper

Upper Division Courses

C100A. Biophysical Chemistry: Physical Principles and the Molecules of Life. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Chemistry 5A or 112A, Mathematics 1A, Biology 119A or 121A. Introduction to thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biological macromolecules (proteins, DNA, and RNA). Molecular distributions, reaction kinetics, enzyme kinetics, Bienergetics, energy transduction, and motor proteins. Electrochemical potential, membranes, and ion channels. Also listed as Chemistry C130. (F,SP)

100B. Biochemistry: Pathways, Mechanisms, and Regulation. Three hours of lecture and one hour of discussion per week. Prerequisites: C100A/Chemistry C130. Formerly half of 100. Bioenergetics, metabolic pathways, and regulation of metabolism; the chemistry, structure, function, synthesis, and degradation of the constituent molecules (amino acids, fatty acids, sugars, nucleotides) and cofactors of the major bioenergetic processes that are directed to metabolic disorders. Designed for majors in the biochemistry and molecular biology, genetics and development, or immunology emphases. (SP) Staff

102. Survey of the Principles of Biochemistry and Molecular Biology. Three hours of lecture and two units of discussion per week. No credit for 102 after taking Chemistry 100 or C100A/Chemistry C130. Students will receive no credit for 102 after taking 100 or 100B or C100B/Chemistry C130. No credit for 102 after taking Chemistry C103. Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A, 1AL, and Chemistry 3B or equivalent courses. Recommended: A course in physical chemistry. A comprehensive survey of the fundamental chemistry, and the ways in which the properties of intermediates and macromolecules affect the structure and function of biological macromolecules, the logic of metabolic pathways (i.e., degradative and biosynthetic) and the molecular basis of genes and gene expression. (F,SP) Staff

103. Bacterial Pathogenesis. (3) Three hours of lecture per week. Prerequisites: C100A/Chemistry C130 or 102 or consent of instructor. This course for upper division students will explore the molecular and cellular basis of bacterial pathogenesis. The course will focus on model microbial systems which illustrate mechanisms of pathogenesis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also include some aspects of bacterial genetics and physi-ology, immune response to infection, and the cell biology of host-parasite interactions. Also listed as Public Health C102 and Plant and Microbial Biology C103. (SP) Portnoy

104. Genetics, Genomics, and Cell Biology. (4) The course will study in one unit for 104 after taking 140 or C142/Integrative Biology C163, or 3 units after taking 110 or 130. Three hours of lecture and one hour of discussion per week. Prerequisites: 102 (may be taken concurrently) or consent of instructor. More students will take 104 to introduce students to key concepts in genetic analysis, eukaryotic cell biology, and state-of-the-art approaches in genomic medicine. Lectures will highlight basic knowledge of cell and molecular genetics, human diseases, particularly cancer. Prerequisite courses will have introduced students to the concepts of cells, the central dogma of molecular biology, and gene regulation. Emphasis is on normal cell processes, including cellular organization, dynamics, and signaling. (F,SP) Staff

110. Molecular Biology: Macromolecular Synthesis and Cellular Function. (4) Students will receive 3 units of credit for 110 after taking 104. Three hours of lecture and one hour of discussion per week. Prerequisites: C100A (may not be taken concurrently); Plan 1 Emphasis 1 (BB) majors should take 100B prior to 110. Molecular biology of prokaryotic and eukaryotic cells including mechanisms of DNA replication, transcription, translation. Structure of genes and chromosomess. Regulation of gene expression. Biochemical processes and principles in membrane structure and function, signaling and subcellular compartmentation, cytoskeletal architecture, nucleocytoplasmic transport, signal transduction mechanisms, and cell cycle control. (F,SP) Staff

110L. General Biochemistry and Molecular Biology Laboratory. (4) Two hours of lecture and six to eight hours of laboratory per week. Prerequisites: 110 (may be taken concurrently). Experimental techniques of biochemistry and molecular biology, designed to accompany the lectures in 110B and 110. (F,SP) Staff

111. Introduction to Structural Biology. (3) Three hours of lecture per week. Prerequisites: C100A/Chemistry C130, 100B. This course for upper division majors will teach principles of protein and nucleic acid structures and outline basic experimental methods for conformational studies. The classical problems of structural biology, as well as new approaches and methods, will be emphasized. (SP) Staff

C112. General Microbiology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C100A/Chemistry C130 or 102 or consent of instructor. This course for upper division biology majors will focus on the molecular bases for physiological and biochemical diversity among members of the two major domains: bacteria and archaea. The ecological significance and evolutionary origins of these domains. Molecular, genetic, and structure-function analyses of microbial cell cycles, adaptive responses, metabolic capability, and macromolecular syntheses will be emphasized. Also listed as Plant and Microbial Biology C112. (F) Ryan, Wilderth

112L. General Microbiology Laboratory. (2) Four hours of laboratory and one hour of discussion per week. Prerequisites: C112 or Plant and Microbial Biology C112 (may be taken concurrently). Experimental techniques of microbology designed to accompany the lecture in 112 and C148. The primary emphasis in the laboratory will be on the cultivation and psychological and genetic characterization of bacteria. Also listed as Plant and Microbial Biology C112L. (F,SP) Komel, Taga

113. Applied Microbiology and Biochemistry. (2) Two hours of lecture per week. Prerequisites: C112 or consent of instructor. A survey of modern developments emphasizing the application of the knowledge of fundamental microbiology to industrial processes. Topics include production of metabolites, enzymes, and single-cell products; genetic manipulation of microorganisms; recovery of minerals; and energy production. (SP) Staff

C114. Introduction to Comparative Virology. (4) Three hours of lecture per week. Prerequisites: Introductory chemistry (1A or 3A-3B or equivalent) and introductory biology (1A, 1AL, 3A, 3B or equivalent) and general biochemistry (C100A or equivalent—previously completed but may be taken concurrently). Viruses will be considered as infectious agents of bac- teria, animals, plants, single-celled algae and fungi (i.e., yeasts). Several families of viruses will be compared with respect to biochemical, structural and morphological properties, and strategies of infection and replication. Also listed as Evolution, Sci, Policy, and Management C138 and Plant and Microbial Biology C114. (SP) Glaunsinger, Jackson

115. Molecular Biology of Animal Viruses. (2) Two hours of lecture per week. Prerequisites: Upper division or graduate status; C100A/Chemistry C130 or C112 or equivalent. Structure, reproduction, mutations, and host cell interactions (including pathogenesis) of animal viruses. This upper division and graduate course will broadly survey the strategies that viruses use to propagate in eukaryote cells, with an emphasis on vertebrate systems and disease-causing viruses. We will also discuss host mechanisms of defense against viruses. Graduate students should plan to enroll in 215. 115/215 are taught concurrently. (SP)

C116. Microbial Diversity. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing. C112 or consent of instructor and organic chemistry (may be taken concurrently). Formerly 116. This course for upper-division and graduate students will broadly survey myriad types of microbial organisms, both procaryote and eucaryate, using a phylogenetic framework to orga- nize the concept of “biodiversity.” Emphasis will be on the evolutionary development of the many bio- chemical themes, how they mold our biosphere, and the organisms that affect the global biochemistry. Molecular mechanisms that occur in different lineages will be compared and contrasted to illustrate fundamental biological strategies. Graduate students addi- tionally should enroll in C216, Microbial Diversity Workshop. Also listed as Plant and Microbial Biology C116. (F) Coates

118. The Cancer Karyotype: What It Is and What It Does. (1) One hour of lecture per week. Prerequisites: 102. 104 recommended. Mutational cancer the- ories do not explain why certain individuals develop individual karyotypes; (2) have polygenic transcrip- tomes and phenotypes; (3) have flexible karyotypes, which evolve progressive malignancy and drug resis- tance, but maintain autonomy and even immortality; (4) Why carcinogens induce cancer only after conspicuously long latent periods of years to decades. To answer these questions, this course tests a new karyotypic theory, which postulates that cancers evolve much like new species. (F,SP) Duesberg

Graduate Courses

200. Macromolecular Reactions and the Cell. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 110 or equivalent. Admission to the course requires formal consent of instructors, except for MCB graduate students and graduate stu- dents in the laboratories of MCB faculty. General course for first-year graduate students. Covers our current understanding of, methodological approaches for analyzing, and recent advances in the function of cellular macromolecules and macromolecular com- plexes in DNA replication, recombination, transposition and repair, gene expression and its regulation, mRNA splicing, genome organization, non-coding RNAs, transcription factor regulation, and its regulation, mRNA splicing, genome organization, non-coding RNAs, signal transduction, protein synthesis, folding and degradation, growth control, and other life processes. (F,SP) Staff

206. Physical Biochemistry. (3) Three hours of lec- ture per week. Prerequisites: Year courses in organic chemistry and physical chemistry. 100 recommended.
211. An Introduction to Structural Biology and Physical Biochemistry. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of Instructor. This course is for molecular and cell biology graduate students. It will teach principles of protein and nucleic acid structure and outline basic experimental methods for conformation studies. The classical problems of structural biology, as well as new approaches and methods, will be emphasized. Courses 111 and 211 are taught concurrently. Students enrolled in 211 will also be required to attend a weekly seminar of gene expression and to prepare a minor proposal. (SP) Staff

C212A. Chemical Biology I—Structure, Synthesis and Function of Biomolecules. (1) Three hours of lecture for five weeks. Prerequisites: Chemistry 200 or consent of instructor. This course will present an overview of the structure of proteins, nucleic acids, and oligosaccharides from the perspective of organic chemistry. Modern methods for the synthesis and purification of these molecules will also be presented. Also listed as Chemical Engineering 212A. (SP) Staff

C212B. Chemical Biology II—Enzyme Reaction Mechanisms. (1) Three hours of lecture for five weeks. Prerequisites: Chemistry 271A or consent of instructor. This course will focus on the principles of enzyme catalysis. The course will begin with an introduction of the general concepts of enzyme catalysis which will be followed by detailed examples that will examine the chemistry behind the reactions and the three-dimensional structures that carry out the transformations. Also listed as Chemistry 271B. (SP)

C212C. Chemical Biology III—Contemporary Topics in Chemical Biology. (1) Three hours of lecture for five weeks. Prerequisites: Chemistry 271B or consent of instructor. This course will build on the principles of enzyme catalysis covered in Chemical Biology I and II. The focus will consist of case studies where rigorous chemical approaches have been brought to bear on biological questions. Potential subject areas will include single-molecule biosynthesis, immunochemistry, cell biology, and cancer. For each topic, the appropriate biochemical techniques will be emphasized. Also listed as Chemistry 271C. (SP)

C214. Protein Chemistry, Enzymology, and Bioorganic Chemistry. (2) At the instructor’s discretion, this course may be taught over a 10 week period with three hours of lecture per week or over a 15 week period with two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This course will focus on the structure of proteins, the principles of protein-protein interactions, enzyme kinetics and mechanisms, and enzyme design. Intended for graduate students in chemistry, biochemistry, and molecular and cell biology. Also listed as Chemistry 230. (SP) Staff

C216. Microbial Diversity Workshop. (1) One hour of workshop and one hour of discussion per week. Prerequisites: Graduate standing; 112 or consent of instructor and organic chemistry (may be taken concurrently). This course will cover research in microbial diversity. Also listed as Plant and Microbial Biology C216. (F) Coates

217A-217C. Selected Topics in Biochemistry and Molecular Biology. (1;1;1) Course may be repeated with credit for change in content. Course may be repeated with permission of instructor. New topics covered each year for five weeks. Prerequisites: Consent of instructor. Recent advances. Topics changed each year. 217A, 217B, 217C are three sections of five weeks each. The sections run independently and may be taken individually. (F,SP) Staff

218. Research Review in Biochemistry and Molecular Biology. Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Recent advances in current literature and discussion of original research. (F,SP)

218B. Molecular and Cellular Engineering Approaches to Investigate Biomedical Problems. (2) Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor. The related areas of stem cell bioengineering, gene delivery systems, and molecular virology, with applications in regenerative medicine and tissue engineering. Schaffer

218E. Viruses as Models for Eukaryote Gene Expression and Function. (2) Recent advances. Also listed as Chemistry C271A. (SP) Staff

218G. Myxobacterial Development. (2) Review of current literature and discussion of original research. D. Zuzman

218H. Protein Synthesis in Bacteria and Mammals. (2) The mechanism of protein synthesis in bacteria and human cells. Specific areas of interest include the structure and function of the ribosome and the regulation of protein synthesis. (F,SP) Cate

218J. Advanced 20th Century Perspectives on Cancer Cell Genetics. (2) Prerequisites: Consent of instructor. Transduction of cellular sequences and genetic regulation of transformation by oncogenic retroviruses as models for eukaryotic transformation. Martin

218K. Cryo-Electron Microscopy of Macromolecules. (2) Structure-function studies of the cytoskeleton and large molecular machines by cryo-electron microscopy and image reconstruction. (F,SP) Nagle

218L. Protein Folding and Stability. (2) The connection between the sequence of a protein and its 3-D structure. (F,SP) Kranta

218M. Biochemistry and Enzymology. (2) Topics at the interface of chemistry and biology with a particular focus on mechanisms of enzyme catalysis. (F,SP) Marletta

218R. The Protein Folding Problem. (2) Protein structure, stability, folding, and the pathway of protein folding. Marggsee

218S. Cryo-Electron Microscopy of Macromolecules. (2) Structure-function studies of the cytoskeleton and large molecular machines by cryo-electron microscopy and image reconstruction. (F,SP) Nagle

218U. Protein Folding and Stability. (2) The connection between the sequence of a protein and its 3-D structure. (F,SP) Kranta

218V. Biophysics of Macromolecule Transport Across Membranes. (2) (F,SP) Kranta

218W. Enzyme Catalysis. (2) Fundamental aspects of enzyme catalysis, as probed by kinetic, spectroscopic, and molecular biological approaches. Kliman

219. Research Review in Biochemistry and Molecular Biology. Course may be repeated with credit for change in content. Twenty hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Recent advances in current literature and discussion of original research. (F,SP)

219F. Eukaryotic Gene Expression. (2) Prerequisites: Consent of Instructor. Protein-DNA interactions and the control of gene expression in eukaryotes. Tjian

219H. Molecular and Cell Biology of Listeria monocytogenes Pathogenesis. (2) Discussion of recent research on the genetics, cell biology, and immunology of the model facultative intracellular bacterial pathogen Listeria monocytogenes. Portnoy

219J. Structure and Function of RNA. (2) RNA structure, folding, and function. Specific topics include ribosome mechanisms, RNA-mediated translation initiation, and protein targeting and secretion. (F,SP) Zhou

219Q. Structural Biology of Molecular Machines. (2) Crystallographic and biochemical studies of protein machines, focused on protein-nucleic acid interactions; analysis of chemomechanical function within protein-nucleic acid complexes. Establishment of research reports and reviews of the current literature and in discussion of current experiments in the field. Berger

219S. Structural Biology of Signaling and Replication. (2) Mechanisms and structure in DNA replication and eukaryotic cell signaling. (F,SP) Kurjan

219T. Signal Transduction Mechanisms. (2) Discussion of recent research on various aspects of signal transduction mechanisms in eukaryotic cells, including G protein-coupled receptors, protein kinase cascades, synthesis and mobilization of lipid mediators, calcium sensing and response pathways, activation and inactivation of nucleic acid expression. New concepts of signal desensitization and physiological adaptation, with strong emphasis on genetic and molecular analysis of these systems, especially in the yeast Saccharomyces cerevisiae. Thörner

219U. Single Molecule Biophysics. (2) Methods of single molecule manipulation and visualization that are used to characterize the structure and mechanophysical properties of translocating DNA binding protein such as RNA polymerase; and to investigate the mechanics of DNA denaturation. New concepts of signal desensitization and physiological adaptation, with strong emphasis on genetic and molecular analysis of these systems, especially in the yeast Saccharomyces cerevisiae. Thörner

219V. Biochemistry of Autophagy. (2) (F,SP) Zhang

219X. Cell Surface Glycoconjugate Interactions. (2) Investigations of cell surface glycoproteins as mediators of cell-cell interactions. Development of new methods for engineering cell surface structures. (F,SP) Bertozzi

219Y. Regulation of HIV Gene Expression. (2) Regulation of HIV gene expression by viral proteins and cellular factors. Factors will be discussed in research reports and reviews of the current literature and in discussion of current experiments in the field. Zhou

219Z. Telomere Synthesis and Dynamics. (2) Emphasizes a study of the replication of eukaryotic telomeric DNA. Special focus on techniques in protein biochemistry and molecular biology. Collins

Division of Cell and Developmental Biology

Lower Division Courses

31. Genes, Cells, and Creatures. (3) Students with credit for Biology 1A and 1B will not receive credit for 31. Two hours of lecture and one hour of discussion per week. An introduction for nonmajors to some important concepts of modern biology, ranging from biological molecules to organisms and the environment. Some possible topics are: (1) What is DNA and how does it serve as genetic material? (2) How does the immune system cope with exposure to disease-causing bacteria? (3) How do embryos develop? (4) Can we determine if a human population that the Earth can sustain? (SP) Witter

32. Introduction to Human Physiology. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: One year high school or college chemistry. A comprehensive introduction to human cell biology. Course will cover the cellular mechanisms underlying human life processes, including cells and membranes; nerve and muscle function; cardiovascular, respiratory, renal, and gastrointestinal
nal physiology; metabolism, endocrinology, and reproduction. (F) Staff

32L. Introduction to Human Physiology Laboratory. (2) Three hours of laboratory and one hour of lecture per week. Prerequisites: 32L or may be taken concurrently. Experiments/fundamental demonstrations are designed to amplify and reinforce information presented in 32L. Exercises include investigations into the structure and function of muscle, nerve, cardiovascular, renal, respiratory, and gastrointestinal systems. (F) Staff

Upper Division Courses

130A. Cell and Systems Biology. (4) Students will receive no credit for 130A after taking 130B. Three hours of lecture and one hour of discussion per week. Prerequisites: 102 and 104. Instructors may waive 104 prerequisite for non-molecular and cell biology majors. This course is a detailed discussion of a wide range of topics in cell biology emphasizing experimental approaches and key experiments that have provided important insights. The course is aimed at conveying an understanding of how cellular structure and function arise as a result of the properties of cellular macromolecules. An emphasis will be placed on the dynamic nature of cellular organization and will include a discussion of the physical properties of cells (dimensions, concepts of free energy, diffusion, biophysical properties). Students will be introduced to quantitative aspects of cell biology and a view of cellular function that is based on integrating multiple pathways and models of regulation (systems biology). (SP) Staff

132. Biology of Human Cancer. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 102 or 110 (may be taken concurrently); Biology 1A, 1AL, 1B. Formerly 135G. The course is designed for students interested in learning about the molecular and cell biology of cancer and how this knowledge is being applied to the prevention, diagnosis and treatment of cancer. Topics covered include tumor pathology and epidemiology; tumor viruses and oncogenes; intracellular signaling; tumor suppressors; multi-step carcinogenesis and tumor progression; genetic instability in cancer; tumor-host interactions; invasion and metastasis; tumor immunology; and cancer therapy. (F) Staff

133L. Physiology and Cell Biology Laboratory. (4) Students will receive no credit for 133L after taking 130L. One hour of lecture and seven hours of laboratory per week. Prerequisites: 104. Experiments analyze some central problems in cell biology and physiology using modern techniques, including DNA cloning and protein biochemistry, fluorescence microscopy of the cytoskeleton, RNA and DNA transfection, and cell cycle analysis of cultured mammalian cells, RNA interference and drug treatments to analyze ion channel function in cell contractility and intracellular signaling. (F) Staff

C134. Chromosome Biology/Cytogenetics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Upper division genetics or cell biology course; concurrent enrollment with consent of instructor. Survey of behavior, structure, and function of chromosomes with emphasis on behavior in model organisms. Topics include mitosis, meiosis, chromosome aberrations, genome function, dosage compensation, transposons, repetitive DNA, and modern cytological techniques, as applied to Plant and Microbial Biology C134. (SP) Candel, Hollick

135. Topics in Cell and Developmental Biology. At least three courses per year will be offered from the following list. (F,SP)

135A. Molecular Endocrinology. (3) Prerequisites: 102, Biology 1A, 1AL, 1B, Chemistry 3A-3B or equivalent, or consent of instructor. Endocrine mechanisms will be covered by which hormones elicit specific responses and regulate gene expression; hormone-receptor interaction; synthesis, transport and targeting of hormones, growth factors and receptors. Offered alternate years in the fall. (F) Firestone

136. Physiology. (4) Students will receive no credit for 136 after Integrative Biology 132. Three hours of lecture and one hour of discussion per week. Prerequisites: Biology 1A, 1AL, 1B, Physics 8A. Physics 8B recommended. Principles of mammalian (primarily human) physiology: anatomical, biochemical, molecular and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section set forth from the classical and recent experimental literature. Prerequisites: satisfactory/satisfactory for CIRM humani- ties and law fellows. Prerequisites: Consent of instructor. This course will provide an overview of basic and applied embryonic stem cell (ESC) biology. Topics will include early embryonic development, ESC laboratory methods, biomatrices for directed differentiation of iPS and embryonic stem cells, and clinical uses of stem cells. Also listed as Bioengineering C218. (SP) Conboy

237SC. Current Ethical, Legal, and Social Issues in Stem Cell Research. (1) One hour of lecture and one-half hour of discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to graduate California Institute for Regenerative Medicine Scholars. Space permitting, graduate students from other departments or graduate groups with consent of instructor. The course will cover key topics in the ethical, social, and legal aspects of stem cell research and medicine, including informed consent, egg and tissue donation, access to medical care, intellectual property, governmental and institutional regulations, and international perspectives on stem cell research. Required for CIRM Scholars. MCB graduate students and trainees cannot substitute this course for 293C. (SP) Thompson

239. Research Review in Cell and Developmental Biology. Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. (F,SP)

239B. Regulation of the Cell Cycle. (2) Rape

239D. Epithelial Function, Structure, and Regulations. (2) Macher

239EE. Cell Morphogenesis. (2) (F)SP Heald

239F. Nuclear envelopal Transport. (2) Weiss

239FF. Signal Transduction and Tumor Suppressor Genes. (2) (F,SP) Lutz

239GG. Mous Neuronal Stem Cell Differentiation. (2) Wurman

239H. Cell Division. (2) Cande

239HH. Mechanisms of Control of Growth and Cell Proliferation. (2) Identification of key developmental pathways that restrict growth and cell proliferation in vivo. Harinaran

239I. Cytoskeleton and Cell Motility. (2) Welsh

239J. Steroid Hormone and Growth Factor Action. (2) Firestone

239K. Secretion and Cell Membrane Assembly. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Formerly 239K. Cell surface growth with empha- sis on the unicellular eukaryote S. cerevisiae. (F,SP) Schekman

239KK. Assembly and Subcellular Organization of Bacterial Organelles. (2) (F,SP) Kor Neil

239M. MicroRNA Functions in Cancer Development, Mouse Tumor Models. (2) Malignant transformation represents the endpoint of successive genetic lesions that confer uncontrolled proliferation and survival, unlimited replicative potential, and invasive growth. (F,SP) He

239N. Biophysics of Cell Motility and Morphogene- sis. (2) Oster

239O. Cancer Biology. (2) Inheritance, chromosome structure and function, gene expression, and the organization of chromosomes in the nucleus. (F,SP) Kepen

239Q. Regulation of Cell Polarity in Drosophila. (2) Oster

239R. Regulation of Cell Polarity in Drosophila. (2) Mechanisms underlying the establishment and maintenance of cellular organization in epithelia and other cell types. (F,SP) Bilder

239S. Cellular Transport Processes. (2) Forte

239U. The Cytoskeleton and Morphogenesis. (2) Formerly 249Z. Review of current literature and discussion of original research. (F,SP)

239V. Molecular Mechanisms of Transduction in Touch and Pain Receptors. (2) Review of current literature and discussion of current research. Current research focuses on elucidating the molecular mecha- nisms of somatosensory mechanotransduction. (F,SP) Bautista

239W. The Cytoskeleton and Morphogenesis. (2) Formerly 249Z. Review of current literature and discussion of original research. (F,SP)

239Y. Molecular Mechanisms of Transduction in Touch and Pain Receptors. (2) Review of current literature and discussion of current research. Current research focuses on elucidating the molecular mecha- nisms of somatosensory mechanotransduction. (F,SP) Bautista
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hours of lecture and one hour of discussion per week. Three genomics. (SP)

and development. (F,SP) Martin

Division of Genetics, Genomics, and Development

Lower Division Courses

41. Genetics and Society. (3) Students will receive 2 units for Molecular and Cell Biology 41 after taking 41X, Interdepartmental Studies 41X, or Plant Biology 41X. Students will receive no credit after taking Letters and Science 18. Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Formerly 218A. Malignant transformation by retroviruses and the role of protein phosphorylation in growth regulation. (F,SP) Martin

239Z. Chromosome Remodeling and Reorganization During Meiosis. (2) How chromosomes are reorganized during meiosis to accomplish the pairing, recombination, and segregation leading up to successful gamete production. Demburg

140. May be taken concurrently. (F)

140L. Genetics Laboratory. (4) Six hours of laboratory and two hours of lecture per week. Prerequisites: Consent of instructor. (F,SP) Staff

410L. Genetics Laboratory. (4) Six hours of laboratory and two hours of lecture per week. Prerequisites: Consent of instructor. (F,SP) Staff

C266. (F,SP) Staff

249D. Mechanisms of Genetic Regulation in Yeast. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. This course is for MCB graduate students. It will teach in-depth introduction to genetics, including mechanisms of inheritance; gene transmission and recombination; transposable DNA elements; function, evolution, and regulation of genetic elements. Some exams may be given in the evening. (F) Staff

249O. Genome Sequences. (2) Biochemistry, cancer biology, and biotechnology. (F,SP) Levine

249J. Developmental and Molecular Genetics of C. elegans. (3) Three hours of lecture and six hours of laboratory per week. Prerequisites: Consent of instructor. The course will cover the ethical concepts and intellectual underpinnings of modern research on the molecular genetics of C. elegans, and development in general and will be based on the primary literature of the field. (F,SP) Staff

249K. Malignant Transformation by retroviruses and the role of protein phosphorylation in growth regulation. (F,SP) Martin

249B. Metazoan Sex Determination. (2) Molecular and genetic aspects of Metazoan sex determination, with emphasis on Drosophila melanogaster. (F,SP) Brem

249C. Nuclic Acid-Protein Interactions and Control of Gene Expression. (2) Biochemical and molecular approaches to the study of eukaryotic messenger RNA splicing and transposition, with an emphasis on Drosophila melanogaster as an experimental system. (F,SP) Rio

249D. Mechanisms of Genetic Regulation in Yeast. (2) Prerequisites: Consent of instructor. Genes, gene expression, and molecular mechanisms that control cell types in the unicellular eukaryote Saccharomyces cerevisiae. (F,SP) Rine

249E. Molecular Genetics of Drosophila. (2) Prerequisites: Consent of instructor. Gene regulation and developmental neurobiology. (F,SP) G. Rubin

249F. Neuronal Development. (2) Malignant transformation by retroviruses and the role of protein phosphorylation in growth regulation. (F,SP) Martin

249G. Developmental and Evolutionary Genetics. (2) Prerequisites: Consent of instructor. We study how genes control pattern formation during development and pattern modification during evolution. (F,SP) Miller

249I. Molecular Genetics of Insect Neuronal Development. (2) Prerequisites: Consent of instructor. Cell adhesion, cell recognition, and cell determination during neuronal development in Drosophila and other insects. (F,SP) Goodman

249J. Developmental and Molecular Genetics of C. elegans. (2) Prerequisites: Consent of instructor. The course will require the use of UNIX operating systems and simple computer scripting. Students without these skills will receive no credit. The course will provide hands-on experience with the sequencing and interpretation of a complex genome. Students will be taught the conceptual understandings of gene regulation and dosage compensation in the nematode C. elegans. (F,SP) Meyer

249M. Saccharomyces Cerevisiae Microtubule Cytoskeleton. (2) Prerequisites: Consent of instructor. Review of current literature and discussion of current research. (F,SP) Stahl

249N. Gene Regulation. (2) Current literature and research in gene regulation will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field. (F,SP) Levine

249Q. Genome Sequences. (2) Biochemistry, cancer biology, and biotechnology. (F,SP) Levine

249R. Mouse Development. (2) Prerequisites: Consent of instructor. The molecular and cellular mechanisms that underlie early mouse development will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field. (F,SP) Brem

249S. Evolution of Development Mechanisms. (2) Evolution of development mechanisms with a focus on the genes that regulate segmentation and regionalization of the body plan. (F,SP) Patel

249T. Theoretical Modeling of Complex Biological Systems; Bioinformatics. (2) Theoretical modeling of complex biological systems; bioinformatics in genetics and development. (F,SP) Rokhsar

249U. Assembly of Eukaryotic Chromosomes. (2) Formerly 219A. Biochemical and genetic characteriza-
tion of proteins that assemble histones onto DNA. Analysis of the relationship of chromatin assembly to DNA replication and gene expression. (F,SP) Kuhlman

249V. Induction in Vertebrate Development and ES Cell Differentiation. (2) The Roelink laboratory is interested in the mechanisms of embryonic induction, the phenomenon in which a group of cells changes the developmental fate of neighboring cells via the release of inducers. (F,SP) Roelink

249W. Epigenetic Mechanisms of Gene Control. (2) Mechanisms and maintenance of heritable phenotypic variation. (F,SP) Hollick

249Y. Mechanisms of Gene Control in Vertebrate Animals. (2) Formerly 218Y. This course will focus on mechanisms of gene control in vertebrate animals, particularly in the area of vertebrate development. (F,SP) Harland

Division of Immunology

Lower Division Courses

50. The Immune System and Disease. (3) Students will receive no credit for 50 after taking 102 or C100A/Chemistry C130. Three hours of lecture and one hour of discussion per week. Prerequisites: High school chemistry or Chemistry 1A and high school biology or Biology 1A. Biology 1AL is not required. Course will discuss how the immune system resolves, prevents, or causes disease. A general overview of the immune system will be covered in the first five weeks followed by five weeks discussing infectious diseases including anthrax, mad cow, herpes, malaria, tuberculosis, and other lectures focusing on current immunology topics including vaccines, autoimmunity, allergy, transplantation, and cancer. (F,SP) Beaney

55. Plagues and Pandemics. (3) Students will receive no credit for 55 after taking 100, C100A, 100B, 102, 103, C103, 150, Chemistry C130, Plant and Microbial Biology C130, and Public Health C102. Three hours of lecture per week. Discussion of how infectious agents cause disease and impact society at large. We will review historical and current examples of plagues and pandemics and consider the question of what we should do to ameliorate the impact of infectious disease in the future. The course is intended for nonmajors and will try to keep the cell, receptor structure and function, genomics of the immunoglobulin superfamily, cells and molecular mediators that regulate the immune response, allergy, autoimmunity, immunodeficiency, cell and tissue transplants, and tumor immunology. (F,SP) Staff

150. Molecular Immunology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: C100A/Chemistry C130, or 102. Fundamentals of immunology with emphasis on biochemical and molecular approaches to study of the immune system and its application in medicine and biotechnology. Topics covered include description of the immune system, antigens and antibodies, cell and tissue transplants, and tumor immunology. (F,SP) Staff

150L. Immunology Laboratory. (4) Eight hours of laboratory and one hour of lecture per week. Prerequisites: 150 (may be taken concurrently); consent of instructor. Formerly Microbiology 130L. Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include PCR and recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunologic techniques covered include cell culture and monoclonal antibody production, flow cytometry, ELISA, immunoprecipitation, and western blot. (F,SP) Staff

Graduate Courses

250. Advanced Immunology. (4) Three hours of lecture and one hour of discussion per week. Prerequisite: Consent or instructor of instructor. This advanced seminar course will consider current research questions and experimental approaches in the immune system. The course will present a 30-minute research talk describing the problems they are studying, the approach they are taking, their preliminary data, and technical problems. (SP) Winoto

251. The Regulation of Immune System Development and Function. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 250 or consent of instructor. This is an advanced seminar course which will consider current research questions and experimental approaches in the immune system. The course will present a 30-minute research talk describing the problems they are studying, the approach they are taking, their preliminary data, and technical problems. (SP) Staff

254. Cancer and Immunology. (2) Two hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Formerly Microbiology 233. Emphasis will be on the treatment or prevention of cancer based on rational approaches derived from recent advances in tumor immunology. The course will examine the application of basic research in immunology and tumor biology to the design of new immunotherapeutic cancer vaccines. (F,SP) Sha

259B. Specificity of T Lymphocytes. (2) Mechanisms of T-cell receptor genes and their transcription controlling proteins/genes. Protein-protein interactions control of RNA turnover and RNA localization. (F,SP) Sha

259H. B-Cell Differentiation. (2) Molecular basis of immune system development and function. (2) Molecular biology of T-cell receptor genes and their transcription controlling proteins/genes. Protein-protein interactions control of RNA turnover and RNA localization. (F,SP) Sha

259I. Regulation of Lymphocyte Development. (2) Molecular mechanisms of gene control in vertebrate animals, particularly in the area of vertebrate development. (F,SP) Harland

259M. Innate Immunity and Innate Control of Adaptive Immunity. (2) Mechanisms of immune surveillance by T lymphocytes. Offered even-numbered years.(SP) Sha

259N. Immunology, Microbiology, and Genetics of Bacterial Pathogenesis. (2) Role of innate host responses in defense against intracellular bacterial pathogens. (F,SP) Vance

Division of Neurobiology

Lower Division Courses

61. Brain, Mind, and Behavior. (3) Students will receive no credit for 61 after taking 61 or C61/Letters and Science C30W. A deficiency grade in 61 or C61/LET-13 or Psychology 119. Three hours of lecture and one hour of discussion per week. Introduction to human brain mechanisms of sensation, movement, perception, thinking, learning, memory, and emotion in terms of anatomy, physiology, and chemistry of the nervous system in health and disease. Intended for students in the humanities and social sciences and others not majoring in the biological sciences. (SP) Presti

C61. Brain, Mind, and Behavior. (3) Students will receive no credit for C61 after taking 61, W61, or Letters and Science C30W. A deficiency grade in 61, W61, or Letters and Science C30W may be removed by taking C61. Three hours of lecture and one hour of discussion per week. Two hours of lecture and one hour of discussion per week. Two hours of lecture and one hour of discussion per week. The historical, chemical, and experimental nature, botanical origins, and effects on the human brain and behavior of drugs such as stimulants, depressants, psychedelics, analgesics, antidepressants, antipsychotics, steroids, and other psychoactive substances of both natural and synthetic origin. The necessary biological, chemical, and psychological background material for understanding the history, the chemical nature, and biological interactions of the major classes of drugs to be discussed. (SP) Presti

64. Exploring the Brain: Introduction to Neuroscience. (3) Students will receive no credit for 64 after taking 61, 610, C180, or Neuroscience C160. Two hours of lecture and one hour of mandatory discussion per week. Prerequisites: High school chemistry or Chemistry 1A; high school biology or Biology 1A. Biology 1AL is not required. Course will introduce students to the fascinating new field of neuroscience. The first part of the course covers basic membrane properties, synapses, action potentials, chemical and electrical synaptic interactions, receptor physiology, and receptor proteomics. The second part of the course covers networks in invertebrates, memory and learning behavior, modulation, vertebrate brain and spinal cord, retina, visual cortex architecture, hierarchy, development, and higher cortical centers. (F,SP) Staff

Upper Division Courses

C160. Introduction to Neurobiology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 102 or C100A/Chemistry C130, Biology 1A and 1AL, Physics 8A-8B. A introductory course designed to provide a generation of students with a basic understanding of the nervous system including how it functions, how it develops, and how it changes with learning and memory. Analysis of the landscape of molecules to circuits to other large networks in other brain functions. Also listed as Neuroscience C160. (F,SP) Staff

160L. Neurobiology Laboratory. (4) Eight hours of laboratory and one hour of lecture per week. Prerequisites: Biology 1A, 1AL, Physics 8A-8B, Molecular and Cell Biology C100A/Chemistry C130 or 102; Molecular and Cell Biology C160/Neurobiology C160; or equivalent. Experimental analyses of properties and interactions of nerve cells and systems, illustrating principal features and current methods. Technology.
niques employed include computer simulation of neuron properties, electrophysiological recording and stimulation of nerves and cells, digitally enhanced video microscopy, fluorescent microscopy, and confocal microscopy. Sensory processing, optical imaging techniques, computer-aided simulation, and functional relationships of the mammalian nervous system. (F)Staff

163. Mammalian Neuroanatomy. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102 or 110, 160. The molecular and biochemical aspects of the structure and function of the nervous system, including ion channels, neurotransmitters and their receptors, second messenger systems, and molecular mechanisms of development and plasticity. (SP)Pr Stats

165. Molecular Neurobiology. (3) Three hours of lecture per week. Prerequisites: 102 or 110, 160. The molecular and biochemical aspects of the structure and function of the nervous system, including ion channels, neurotransmitters and their receptors, second messenger systems, and molecular mechanisms of development and plasticity. (SP)Pr Stats

166. Biophysical Neurobiology. (3) Three hours of lecture per week. Prerequisites: Biology 1A, 1AL, Physics 8A-8B, Chemistry 1A, 3A-3B, and consent of instructor. Formerly 115. Biophysical properties of ion channels and excitability of selected nerve and muscle preparations. Sensory transduction, optical measurements and microscopy. Cellular networks as computational devices, information processing and transfer. (F)Lec

167. Physiological and Genetic Basis of Behavior. (1) One unit. Must be taken in concert with one hour of discussion per week. Prerequisites: C160 and 102 or 110, or consent of instructor. Genetic, cellular, and circuit-level analysis of how the nervous system generates behavior, memory, and learning in a variety of systems. Focus is on model systems for animal behavior. Principles, cellular and circuit specializations, and neural computations for behavior will be presented. (SP) Staff

Graduate Courses

260. Principles of Neuroscience. (4) Four hours of lecture per week. Prerequisites: 160 and 160L or equivalent or consent of instructor. Comprehensive survey of current state of knowledge in molecular, cellular, developmental, integrative and behavioral aspects of neurobiology. (F)Staff

C261. Advanced Cellular Neurobiology. (3) Three hours of lecture per week. Prerequisites: 160, Physiological and Genetic Basis of Behav. (1) One unit. Must be taken in concert with one hour of discussion per week. Prerequisites: C160 and 102 or 110, or consent of instructor. Genetic, cellular, and circuit-level analysis of how the nervous system generates behavior, memory, and learning in a variety of systems. Focus is on model systems for animal behavior. Principles, cellular and circuit specializations, and neural computations for behavior will be presented. (SP) Staff

C262. Advanced Topics in Systems Neuroscience. (3) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 160 or equivalent. Advanced coverage of current research problems in systems-level neuroscience, and experimental and computational techniques used for these studies. Also listed as Neuroscience C262. Offered odd-numbered years. (F)Staff

C263. Advanced Developmental Neurobiology. (3) Three hours of lecture per week. Prerequisites: 162 or equivalent. Advanced level coverage of current research problems in the embryonic and post-embryonic development of vertebrate and invertebrate nervous systems. Also listed as Neuroscience C263. Offered odd-numbered years. (SP)Staff

269. Research Review in Neurobiology. Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory, pass/no pass, or letter grade basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. (F,SP)

269A. Special Topics in Neuroplasticity. (2) Molecular and cellular studies of nerve growth, axon guidance, synaptic formation, and synaptic plasticity using electrophysiological and optical imaging techniques. (F,SP) Poo

269B. Synaptic Transmission and Neuromodulation. Course may be repeated for credit as topic varies. Two hours of lecture per week. Prerequisites: 102 or 110, 160. The molecular and biochemical aspects of the structure and function of the nervous system, including ion channels, neurotransmitters and their receptors, second messenger systems, and molecular mechanisms of development and plasticity. (SP)Pr Stats

269D. Signaling Within and Between Neurons. (2) Review of recent research in molecular mechanisms involved in intracellular and extracellular signaling in the nervous system. (F,SP) Kramer

269H. Recent Advances in Retinal Neurobiology. (2) (F,SP) W erb lin

269J. Taste Recognition in Drosophila. (2) The molecular and cellular basis of taste perception in the model organism Drosophila melanogaster. (F,SP) Scott

269K. Protein Trafficking and Synapses Formation. (2) Molecular mechanisms of polarized protein trafficking and synaptogenesis in neurons. (F,SP) Chen

269M. Insect Neurophysiology. (2) Drosophila mutants selected in a screen that have behavioral abnormalities at a genetic level and basic features of nervous system structure and function. Tanouye

269Q. Sensory Processing and Plasticity in Cerebral Cortex. (2) How the cerebral cortex processes sensory input and stores information about the sensory world. We focus on the rat’s primary somatosensory (S1) cortex. (F,SP) Feldman

269R. Potassium Channels and Synaptic Plasticity. (2) (F,SP) I as o ff

269S. Molecular Mechanisms of Olfaction. (2) (F,SP) Ngai

269T. Processing of Visual Information in the Mammalian Brain. (2) (F,SP) Dan

269U. Evaluation of Current Research in Molecular Mechanisms Underlying Diseases of the Retina. (2) Flannery

269W. Neural Activity Affecting the Assembly of Neural Circuits. (2) How neural activity affects the assembly of neural circuits. Feller

All Divisions

Lower Division Courses

15. Current Topics in the Biological Sciences. (2) Course may be repeated for credit as topic varies. Two hours of lecture and one hour of discussion per week. Prerequisites: Suitable for freshmen who plan to major in a biological science. Students in this course will critically examine the modern methods of biological investigations and their social implications. Relevant literature will be used to present basic biological concepts that address the cultural, technological, and health aspects of current topics in the biological sciences. Designing and evaluating scientific questions will be stressed. (SP) Matsui

84. Sophomore Seminar. Course may be repeated for credit as topic varies. One hour of seminar per week. Prerequisites: Consent of instructor. Sophomore seminars offer opportunity for close, individual attention to the academic life and the culture of the university as they relate to majoring in biology. Students will learn concepts, skills, and information that they can use in their major course, and as future scientific and industry professionals. Restricted to freshmen in the biology scholars program. Also listed as Plant and Microbial Biology C96 and Integrative Biology C96. (F) Matsui

98. Directed Group Study. (1-4) Course may be repeated for credit. One hour of lecture per week per unit for 15 units. Must be taken on a pass/not pass basis. Prerequisites: Freshmen and sophomores only. Lectures and small-group discussions focusing on topics of interest, varying from semester to semester.

99. Supervised Independent Study. (1-4) Course may be repeated for credit. One unit of credit is given for every three hours of work in the laboratory per week for a maximum of 4 units. Supervised research. Must be taken on a pass/not pass basis. Prerequisites: 3.3 GPA and consent of instructor. (F,SP)

Upper Division Courses

180. Undergraduate Teaching of Biology 1A Laboratory. (1,2) Course may be repeated for a maximum of 4 units. Conference with instructor and teaching hours as assigned per week. Must be taken on a pass/not pass basis. Prerequisites: Biology 1A, 1AL with a minimum grade of B. Appointment as a UGSI in biology by consent of instructor. Restricted to undergraduate students. Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three-hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.). (F,SP) Staff

180C. Undergraduate Teaching of Molecular and Cell Biology 32 Laboratory. (1,2) Course may be repeated for credit as topic varies. Two hours of seminar per week. Prerequisites: Consent of instructor and teaching hours as assigned per week. Must be taken on a pass/not pass basis. Prerequisites: 32, 138, or Integrative Biology 132 and Molecular and Cell Biology 32L or Integrative Biology 132L. Laboratory courses in physiology with minimum grades of B. Appointment as a UGSI in physiology by consent of instructor. Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three-hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.). Students will be graded on laboratory attendance and preparation of one quiz. (F) Staff

H196A. Honors Research. (1-4) Individual laboratory research and conferences. Must be taken on a pass/not pass basis. Prerequisites: Senior honors status and consent of instructor. Supervised research and thesis preparation under the supervision of a faculty member. Acceptance to the Molecular and Cell Biology Honors Program is required. Contact the MCB Undergraduate Affairs office, 2083 Valley Life Sciences Building, for application and details. Honor
students must complete at least two semesters of research, taking a minimum of 4 units and a maximum of 8 units of H196A-196B. If desired, one semester of 199 can be used to replace H196A. (F,SP) Staff

H196B. Honors Research. (1-4) Individual laboratory research and conferences. Prerequisites: Satisfactory status and consent of instructor. Individual research and completion of thesis under the supervision of a faculty member. This course satisfies the thesis requirement in molecular and cell biology. Closely supervised work directed toward the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology. (SP) Staff

292. Research. (3-12) Course may be repeated for credit. Laboratory research, conferences. Individual research under the supervision of a faculty member. (F,SP) Staff

293A. Research Seminar. (2) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Consent of instructor. Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology. (SP) Staff

293B. Research Seminar. (2) Three hours of seminar per week. Credit and grade to be awarded on completion of sequence. Prerequisites: Consent of instructor. (SP) Staff

293C. Responsible Conduct of Research. (1) Course may be repeated for credit. One and one-half to two hours of case history discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. This course will cover topics in responsible conduct in research drawn from case studies of the Association of American Medical Colleges and the NIH. Students will review case studies in preparation for class discussion. Required of all MCB graduate and postdoctoral students funded on NIH training grants. One session will probably feature a guest lecturer on a topic relevant to the course. (SP) Staff

295. Careers in Life Sciences Ph.D.s. (1) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Open to graduate students. This course is designed to assist graduate students in the biological sciences in planning their postgraduate careers. Weekly guest speakers will present their experiences on a variety of topics. Prerequisites: Consent of instructor. Topics may include academia; job searches; setting up a laboratory; patent law/technology transfer; public policy/regulatory affairs; bioinformatics; science writing; technical/public affairs; forensic science; postdoctoral positions in industry; teaching; and other topics of interest. (SP) Staff

297. Methods and Logic in Biology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. formerly Interdepartmental Studies 282. Reviews and reports of current research in tumor biology. (F) Firestone

290. Graduate Seminar. (1) Course may be repeated for credit. One to two hours of seminar per week. Prerequisites: Graduate standing in the department or consent of instructor. Graduate student presentations on selected research topics in molecular and cell biology. Several sections covering different topics offered each semester. Concurrent enrollment in more than one section is permitted. List of topics to be announced before each semester. (F,SP) Staff

291A. Introduction to Research. (2-12) Laboratory research, conferences. Credit and grade to be awarded on completion of sequence. Prerequisites: Consent of instructor. Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology. (F) Staff

291B. Introduction to Research. (2-12) Laboratory research, conferences. Credit and grade to be awarded on completion of sequence. Prerequisites: Consent of instructor. Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology. (F) Staff

Music

(Musicianship)

†Michael Senturia

†Lawrence H. Moe

†Daniel Heartz

Alan Curtis

†Christy Dana, D.M.A.

†Mary Kay Duggan, Ph.D.

†Bonnie C. Wade

Michael Sanchez (Emeritus)

Oly Wilson (Emeritus). Ph.D.

Associate Professor

Myra Melford, B.A. Evergreen State College. Improvisation, jazz

Assistant Professors

Franck Bedrossian, Diplôme, Paris Conservatory of Music, Composition.

James Davies, Ph.D. University of Cambridge. Historical musicology, computer music.

Nicholas Mathew, Ph.D. Cornell University. Historical musicology, 19th-century music and politics.

Tamara Roberts, Ph.D. Northwestern University. Ethnomusicology

Ken Umezawa, Ph.D. Harvard University. Composition

Senior Lecturers

Christy Dana, D.M.A. (Musicianship, Jazz)

Karen Rosenak, D.M.A. (Musicianship)
The Department of Music fosters the cultivation of music on campus through undergraduate and graduate programs of study, and also public concerts and lectures in Hertz Hall, Morrison Hall, and elsewhere. For undergraduates, the department offers a major in music as well as numerous non-major courses for students with little or no previous experience in music. A minor in music draws on courses for either majors or nonmajors, depending on student qualifications. For graduate students the department offers programs leading to the M.A./Ph.D. or Ph.D. degrees in musical composition, history and literature, or ethnomusicology. The department’s theory courses provide an introduction to the materials of musical composition through ear training, harmony, counterpoint, and analysis. The history and literature courses present a survey of Western music and detailed study of the chief periods of its development. Courses in ethnomusicology provide study of specific areas of world music, both in survey and in depth, and also provide an introduction to the principles and methods of research. Courses in performance (including orchestra, chorus, and various ensembles) offer the opportunity to perform a varied repertory and are open by audition to all students and auditors.

All students who wish to enroll in performance courses should visit the department website for information on audition appointments at music.berkeley.edu/performance/audition.php.

Note: Students who plan to major in music or take any of the courses designed primarily for music majors must complete the Music Placement Procedure, which is offered each semester the week before instruction begins. Visit music.berkeley.edu/academics/undergraduate/placementproc.php for details. The examination may be taken on an advisory basis.

Prospective music majors are encouraged to begin the music program early, preferably in their freshman year. Staff advisors as well as all members of the faculty are available to consult with students interested in the music program.

The Center for New Music and Audio Technologies (CNMAT) provides computer music and interdisciplinary research in applications of computer technology to sound.

The Major

Goals of the Music Major:

• Through the total set of requirements for the major, gain knowledge of music in an integrated way, encompassing historical and cultural studies, musicianship and theory, and performance. This prepares students either to pursue a career in some aspect of music or to include music as an integral part of their lives.

• Cultivate musical competence, including literacy (the use of music notation in reading, performing, composing, analyzing, and hearing music).

• Develop skills of critical thinking and writing about music through courses on past and present musical cultures in European and other heritages.

• Create music through performing and composing/improvising.

• Pursue individual interests by upper-division elective course selection, including independent study and honors projects.

Lower Division:

• 49A, Introduction to Criticism;

• Musicianship series (49B, 50, 51); and

• Musicianship 20A, 20B/Harmony 25A, 25B.

History and Culture series: four courses from 74-77 as follows:

• 76 (18th and 19th centuries);

• 77 (20th century); and

• 75, 77, or another section of 74.

Upper Division:

• One seminar from 170-189; and

• A minimum of 21 additional units of music major courses from 130-189 and other upper division music courses with an M prefix. Must include at least three semesters of performance from 140-149 and/or 150A-H (excluding 150C). See department for approval.

Performance courses may be taken at any point in the student’s career. Students are expected to shape their programs according to their particular interests, utilizing the 21 units of music major electives and, if they wish, additional courses from both within and outside the department. Suggested areas of specialization include composition, musicology, and various areas of world music, Western music history, conducting, performance, improvisation, theory and analysis, cognitive science, and music technology. At least once a semester, students will consult with their advisors to discuss their programs.

Note: All courses taken for the major must be taken for a letter grade and receive a final grade of C- or higher.

Honor Program. The Department of Music offers an individualized program leading to the B.A. degree with honors. Students with a GPA of 3.3 overall and 3.5 in the major may apply in the Honors Program in the last two semesters of their undergraduate study. Under course H195, students undertake a special project exceeding the scope of regular coursework for one or two semesters. Application forms with more detailed criteria for approval can be obtained from the department office and must be submitted by the end of the first week of classes in the semester in which the project is started.

The Minor

Lower Division:

• Musicianship 20A;

• Either Musicianship 20B or Harmony 25A; and

• A survey course: 26AC or 27 or 29.

Music major courses—49A, Thinking about Music; 49B, Musicianship; and 49C, Harmony—may be substituted if the student has placed into 49B in the department musicianship exam. Course 49C must be taken concurrently with or before 49B. Visit the department website for details.

Upper Division:

A minimum of five upper-division music courses from 100-149 satisfying the following:

• at least one course must be from the 140 series, Performance Ensembles;

• at least one course must not be from the 140 series; and

• courses that may be repeated for credit may count toward the minor a maximum of three times.

Upper-division music major courses 151-189 may be substituted if the student has completed the prerequisites.

Note: All courses taken for the minor must be taken for a letter grade. All courses taken for the minor must be taken for a letter grade and receive a final grade of C- or higher. At least three of the five upper division courses must be completed at Berkeley.

When students have satisfied the requirements, they should file a petition in the Department of Music office for confirmation that they have completed the minor program. They should bring a copy of their unofficial transcript.

Graduate Programs

The Department of Music offers programs leading to the M.A./Ph.D. and Ph.D. degrees in composition and musicology, the latter with options in the history and literature of Western music and ethnomusicology (not in music education or performance). Applications for admission are considered only once a year for the fall semester; the application deadline is December 1.
Lower Division Courses

20A-20B. Basic Musicianship. (2-2) Three hours of lecture per week. Prerequisites: 20A is a prerequisite to 20B. Fundamentals of music, including notation, sight singing, ear training, and beginning linear analysis. For non-music students. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen.

25A-25B. Introduction to Music Theory. (3-3) Three hours of lecture, one hour of discussion per week. Prerequisites: 20A or other basic musicianship course or consent of instructor. A writing course based on traditional harmony. Beginning linear and vertical analysis. For general students. Emphasis on written exercises. (F,SP)

26AC. Music in American Culture. (4) Two hours of lecture, one hour of discussion, and one hour of listening per week. Two perspectives are developed: (1) diverse music of groups in America and (2) American music as a unique phenomenon. Groups considered are African, Hispanic/Latino, Native American, and Asian. Lectures and musical examples are organized by topics such as music of socioeconomic subgroups within large groups, survival of culture, popular and commercial, and the folk and popular-music continuum. This course satisfies the American Cultures requirement. (F,SP)

27. Introduction to Western Music. (4) Two hours of lecture and one hour of discussion per week. Devoted to the development of listening skills, and a survey of major forms and styles of Western art music. (F,SP) Staff

29. Music Now. (4) Two hours of lecture and one hour of laboratory per week. This course explores the basic materials and models that set the boundaries for various present-day musical experiences. Students are exposed to terminology and modes of engagement with the aim of inspiring new paradigms of listening (e.g., listening to silence, noise, space, and timbre). Composers and musicians of today continue to explore new ways of defining and organizing sounds into music. This course focuses on the most avant-garde music of our time, but the concepts learned can be applied to any style of music. The course is designed to enrich and deepen the students’ musical abilities through individual and group music-making assignments. Direct engagement through listening and participation is accomplished in part with software created at the Center for New Music and Audio Technologies. The target audience includes students to be able to read music or own a personal computer. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Sections 3-4 are graded on a letter-grade basis. Sections 5-7 are graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

40. Group Carillon Lessons for Beginning Students. (1) One hour of private lesson per week. Prerequisites: Consent of instructor. A course designed for students who wish to attain a beginning level of proficiency on the carillon. Prospective students must have some knowledge of the keyboard, read treble and bass clefs fluently, be secure in key signatures through three sharps and flats, and be comfortable with common duplet and triple meters. (F,SP) Staff

41A. Private Carillon Lessons for Beginning Students. (1) Course for a maximum of six units as long as B average is maintained. One half-hour lesson every week, plus participation in the student recital. Prerequisites: 40 or consent of instructor. Private carillon lessons to develop a personal repertory. In this course, students will begin to learn different practice techniques. (F,SP) Davis

41B. Private Carillon Lessons for Intermediate Students. (2) Course may be repeated for a maximum of 6 units as long as a B average is maintained. One-half hour lesson per week, one 10-minute concert each week, plus participation in the student recital. Prerequisites: 41A, B, and/or consent of instructor. (F,SP) Davis

41C. Private Carillon Lessons for Advanced Students. (2) Course may be repeated for a maximum of 6 units as long as a B average is maintained. One hour of laboratory per week. Prerequisites: 41A, 41B, and/or consent of instructor. Formerly 42. This course is designed for students to reach an advanced level of proficiency. Students are required to play one 10-minute concert per week plus participate in the student recital. (F,SP) Davis

42. Carillon Lessons for Advanced Students. (2) Course may be repeated for a maximum of 6 units as long as a B average is maintained. One hour of private lesson per week, one 10-concert per term, and one 10-minute recital every 6 weeks. Prerequisites: 41B, consent of instructor. This course is a requirement for those students who are studying for examination by the Guild of Carillonneurs in North America. (F,SP) Staff

43. Introduction to Improvisation. (3) Three hours of lecture per week. Prerequisites: 20A or equivalent and audition. This course will serve as an introduction to performance practices in contemporary improvisation. Students will be exposed to music of the past, contemporary improvisation exercises and games and repertoire development. Assignments will include listening and analysis of recorded and live performances and the creation of student works. (F,SP) Melford

44. Voice Class. (1) Course may be repeated for credit. Two hours of studio per week. Prerequisites: Students must undergo an initial vocal assessment in the first class session before being admitted into the class. This course will provide students with a functional understanding of the fundamentals of healthy singing. Topics will include vocal technique (alignment, breathing, negotiating the full vocal range, vowel production), the art of vocalizing, lyric dictation, and repertoire selection. The class will focus on the “bel canto” (classical) style of singing, this same technique is applicable and useful to musical theater, jazz, and pop singing. Within a laboratory setting, students will receive group instruction and personalized individual feedback and attention as possible. Singers will prepare two songs in the course for the semester, one in English and one in a foreign language, to be performed in a jury and performance in the final exam. This course is open to all undergraduates across campus. Students interested in campus vocal ensembles are encouraged to enroll. No prior music experience is required. (F,SP) Johnson, C.

49A. Thinking about Music. (2) Two hours of lecture per week. Prerequisites: Music Placement Exam: 49B-49C (to be taken concurrently). As a complement to Music 49B and 49C, this course introduces current and intending majors to perspectives that are central to the study of music. The course will explore and discuss themes such as music and meaning, the relationship between written and aural transmission of music, and the interpretation of musical traditions, repertories, and practices in relation to particular socio-historical contexts. Topics and music will be studied by instructor. (F)

49B. Musicianship. (3) Three hours of lecture per week. Prerequisites: Music Placement Examination. (F,SP)

Formerly 50A. Diatonic sight singing, ear training, and keyboard harmony. (F,SP)

49C. Harmony. (3) Three hours of lecture per week. Prerequisites: Music Placement Examination. Formerly 60A. Diatonic harmony, choral harmonization, and analysis of choral literature. Emphasis on written exercises. (F,SP)

50. Musicianship. (3) Three hours of lecture per week. Prerequisites: Advanced Placement in Music Placement Examination or 50. Formerly 51A. Sight reading, ear training, keyboard harmony, and score reading involving increasing chromaticism. (F,SP) Staff

51. Musicianship. (3) Three hours of lecture per week. Prerequisites: Advanced placement in Music Placement Examination or 50. Formerly 51A. Sight reading, ear training, keyboard harmony, and score reading involving increasing chromaticism. (F,SP) Staff

60. Harmony. (3) Three hours of lecture per week. Prerequisites: Advanced placement in Music Placement Examination or 50. Formerly 51A. Diatonic harmony, modulation, introduction to altered chords, choral harmonization, and analytic studies. Emphasis on written exercises. (F,SP)

73. African American Music. (4) Three hours of lecture and one hour of discussion per week. Focus on a variety of musical practices both historical and contemporary, including popular and religious forms. Content will vary and may include genres such as blues, jazz, gospel, and hip-hop, explored with attention to race, gender, and the working of the music industry. (F,SP) Roberts

76. Introduction to Selected Musics of the World. (4) Course may be repeated for credit. Three hours of lecture and one hour of performance laboratory per week. Focus on performance practice, form, styles, instruments, and meanings of particular musics from an ethnomusicological perspective. The musics to be studied vary; see offerings in the 130 series for specific course descriptions. Alternate lower-division course numbering for lower division majors enrolling in the 130 series. This course will meet lower-division major requirement. (F,SP) Brinner, Guilbault, Wade

77. History of Western Music: Music to 1700. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Music Placement Examination, 49C (may be taken concurrently). Formerly 171A. This course will provide students with an introduction to music history and criticism, and an introduction to music history and criticism, and practice in analytical methods for music of all periods, with emphasis on listening, exercises, and papers. (SP) Toruskin

78. History of Western Music: The 18th and 19th Centuries. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 60 (may be taken concurrently). Formerly 70. Music of the 18th and 19th centuries. An introduction to music history and criticism, and practice in analytical methods for music of all periods, with emphasis on listening, exercises, and papers. (F) Taruskin

77. History of Western Music: The 20th Century. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 60. Formerly 170. Music of the 20th century. (SP) Toruskin

97. Field Studies. (1-3) Course may be repeated for credit. One to three hours of fieldwork per week. Must be taken on a passed/not passed basis. Prerequisites: Music Major. Department organized and supervised field programs involving experiences in tutoring and musical activities. Students taking the course for the first time will be provided with training suitable to the subject matter being taught. (F,SP) Staff

98. Directed Group Study for Freshmen and Sophomores. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to
Courses and Curricula section of this catalog. Two contact hours per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Lower division courses 116M, 116A, or consent of instructor. Group study in a field that may not coincide with that of any regular course. (F,SP) Staff

99. Independent Study for Freshmen and Sophomores. (1-3) Contact per hour or contact per unit. Prerequisites: Consent of instructor. Formerly 115. A review of the sensory, perceptual, and cognitive foundations of listening, composing, and performing. Topics include relations among various acoustical and perceptual characterizations of sound; perception of pitch, temporal relations, timbre, stability conditions, and auditory space; auditory scene analysis and perceptual grouping mechanisms; perceptual principles for melodic, rhythmic, and harmonic organization; orchestration as spectral composition. A course research project is required. Wessel

108. Music Perception and Cognition. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Consent of instructor. Formerly 115. A review of the sensory, perceptual, and cognitive foundations of listening, performing, and composing. Topics include relations among various acoustical and perceptual characterizations of sound; perceptions of pitch, time, temporal relations, timbre, stability conditions, and auditory scene; auditory scene analysis and perceptual grouping mechanisms; perceptual principles for melodic, rhythmic, and harmonic organization; orchestration as spectral composition. The course research project should involve the analysis of musical examples or perceptual and cognitive issues in music theory or both. Wessel

109. Music Cognition: The Mind Behind the Musical Ear. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. A study of the cognitive processes that underlie music perception, with an emphasis on the psychological and neural mechanisms that mediate musical intelligence. Topics include the role of perception in musical cognition, the development of musical abilities, and the relationship between music and language. Students will explore the neural basis of musical processing and the cognitive processes involved in music understanding and production. (F,SP) Dana

116A. Jazz Theory and Performance 1. (3) Students will receive no credit for 116A after taking 116 or 116M. Three hours of lecture and one hour of studio per week. Prerequisites: Audition; Formerly 116. A systematic study of jazz theory including scales, chords, keyboard voicings, solo transcription, and tune study approached through playing, singing, listening, writing, improvisation, analysis, and small ensemble playing. (F,SP) Dana

116B. Jazz Theory and Performance 2. (3) Three hours of lecture and three hours of studio per week. Prerequisites: 116A or consent of instructor; Audition. Advanced concepts in theory and performance in the jazz vernacular tradition, including melodic minor and diminished chords and scales, reharmonization, I Got Rhythm changes, Coltrane changes, use of pentatonic and 4ths, playing outside, solo analysis, piano voicings, and an introduction to jazz arranging and composition. Activities will include in-depth analysis and transcription and analysis, historical and analytical readings, arranging and composition projects for small ensemble, and three hours of small-ensemble rehearsal each week. (F,SP) Dana

116M. Jazz Theory and Performance 2. (3) Two hours of lecture and three hours of studio per week. Prerequisites: 116, 116M, 116A, or 116AM, or consent of instructor; Audition. Advanced concepts in theory and performance in the jazz vernacular tradition, including melodic minor and diminished chords and scales, reharmonization, I Got Rhythm changes, Coltrane changes, use of pentatonic and 4ths, playing outside, solo analysis, piano voicings, and an introduction to jazz arranging and composition. Activities will include in-depth analysis and transcription and analysis, historical and analytical readings, arranging and composition projects for small ensemble, and three hours of small-ensemble rehearsal each week. (F,SP) Dana

116B. Theory and Performance in the History of American Music. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 27 or consent of instructor. For nonmajors. A comparative study of different composers in Western music. Topic will vary each semester. (F,SP) Staff

128A. Opera. (3) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. A study of musical and dramatic aspects of opera. Lectures on selected operas will be supplemented by assigned readings and films or videotapes of notable performances. 128AM. Opera. (4) Students will not receive credit for 128AM after taking 128A. Three hours of lecture per week. Prerequisites: 61B, and 75 or 76. Restricted to music majors. An examination of the development of the operatic genre from its origins to the present. Lecture topics will include short writing and playing exercises, transcription and analysis, historical and analytical readings, arranging and composition projects for small ensemble, and three hours of small-ensemble rehearsal each week. (F,SP) Dana

128B. Beethoven. (3) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. This course is an introduction to Beethoven's music and its historical contexts. While closely analyzing individual works, this course also examines how Beethoven and his music have been represented and interpreted until our own day, exploring the values—musical and cultural—that have ensured Beethoven's towering position in Western music. 128BB. Beethoven. (3) Three hours of lecture per week. Prerequisites: 27 or consent of instructor. This course is an introduction to Beethoven's music and its historical contexts. While closely analyzing individual works, this course also examines how Beethoven and his music have been represented and interpreted until our own day, exploring the values—musical and cultural—that have ensured Beethoven's towering position in Western music. (F,SP) Matthew

128D. J. S. Bach. (3) Three hours of lecture per week. Prerequisites: Consent of instructor; Audition. An introduction to the music of J. S. Bach (1685-1750), a central figure in the history of Western art music. The course includes discussion of his organ music, harpsichord works, cantatas, Passion settings, and instrumental chamber music. Lectures will cover the relationship between Bach's biography and his compositions, and places study of the man and his music in its cultural and historical context. Required work will include one short paper and one longer paper. There will also be weekly studio sessions. (F,SP) Dana

128DM. J. S. Bach. (4) Three hours of lecture per week. Prerequisites: Restricted to music majors. An introduction to the music of J. S. Bach (1685-1750), a central figure in the history of Western art music. The course will include study of his organ music, harpsichord works, cantatas, Passion settings, and instrumental chamber music, discussing the relationship between Bach's biography and his compositions, and places study of the man and his music in its cultural and historical context. Required work will include one medium-length paper, one longer research paper, and one analytical study. There will also be weekly reading and listening assignments. (F,SP) Staff

128E. Mozart and Haydn. Three hours of lecture per week. Prerequisites: Consent of instructor. A study of a song and the interaction of poetry and music, from late 18th through the 20th centuries, through the lens of a selected text by Schubert, with Russian in translation. Music by composers ranging from Mozart and Schubert to Gershwin and Bernstein will be included, with occasional live performances by local artists.

128T. The American Musical. (3) Three hours of lecture per week. A study of the American musical in the 20th century, beginning with its roots in operetta, vaudeville, and Gilbert and Sullivan, and focusing on its connections to politics, technology, film, opera, and its cultural context. A study of a variety of musical styles, including Tin Pan Alley, jazz, and rock. We will consider a selection of shows through a series of theme units, including American mythologies (and counter-mythologies), race and ethnicity, gender and sexuality, issues of fandom, and performance of personal identity. For nonmajors. (F,SP) Replodge-Wong

128TM. The American Musical. (3) Three hours of lecture per week. A study of the American musical in the 20th century, beginning with its roots in operetta, vaudeville, and Gilbert and Sullivan, and focusing on its connections to politics, technology, film, opera, and a variety of musical styles, including Tin Pan Alley, jazz, and rock. We will consider a selection of shows through a series of theme units, including American mythologies (and counter-mythologies), race and ethnicity, gender and sexuality, issues of fandom, and performance of personal identity. For nonmajors. (F,SP) Replodge-Wong

130B. African American Music. (4) Three hours of lecture and one hour of discussion per week. Historical and analytical study of African American music in the 20th-century. Emphasis on the evolution of jazz and various forms of popular and religious music. (F,SP) Staff

130BM. African American Music. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Restricted to music majors; 51B and 61B. Historical and analytical study of African American music in the 20th-century. Emphasis on the evolution of jazz and various forms of popular and religious music. Analytic studies and a term paper required. Roberts

131A. Music of India. (4) Three hours of lecture and one hour of laboratory per week. Formerly 133B.
Prerequisites: Audition.

May be repeated for credit. Four hours of rehearsal per week. Prerequisites: Music majors only. By audition, for experienced vocalists. A comprehensive program of vocal studies including participation in University Choruses, vocal technique training, and ensemble work with other instrumentalists or vocalists. The student's program will be worked out in consultation with the faculty in charge of the course. Each student's studies will lead to some kind of public performance. (F,SP) Kuzma

150C. Keyboard Performance. (2) Course may be repeated for credit. Four hours of studio per week. Prerequisites: Music majors only. By audition, for experienced performers of keyboard or related instruments. The program will focus on the study of solo repertoire. The student's program will be worked out in consultation with the faculty in charge of the course. Each student's studies will lead to some kind of public performance. (F,SP) Matthews

150D. Various Musical Practices Performance. (3) Course may be repeated for credit. Must be taken for a letter grade. Four hours of studio per week. Prerequisites: Music major only. By audition. Intermediate or advanced instruction in musical practices not encompassed in 150A-150B-150C, within the context of a directed academic program of studies. Students must have experience on the instrument or have studied it in the 130 series. The student's program will be worked out in consultation with the faculty in charge of the course. Each student's studies will lead to some kind of public performance. (F,SP) Bradley

150E. Jazz Performance. (1-3) Course may be repeated for credit. Three to nine hours of practice/performance per credit. Prerequisites: Open to music majors by audition only. Intermediate or advanced instruction in the performance of jazz and improvisation. A directed program of study including participation in department-sponsored or UC Jazz ensembles, workshops, and special projects where applicable. Will include instruction and/or coaching, individually or in groups. Each student's studies will lead to some kind of public performance. The student's program will be worked out in consultation with the faculty in charge of the course. Units range from 1 to 3, depending on number of lessons and ensemble participation. (F,SP) Melford

150F. Ensemble Work for Keyboard Players. (1) Course may be repeated for credit. Minimum of one hour of studio per week. May be repeated for credit if student maintains B average. Prerequisites: Music majors only. By audition for skilled keyboard players. This program includes instruction in the solo and group performance aspects of keyboard performance that do not involve the solo repertoire. These include, but are not limited to, piano duets, obligato keyboard parts to standard instrumental repertoire, Lieder and melodic accompaniment, and keyboard arrangements for operatic, theatrical, or instrumental ensembles. Each student's program will be adapted to his/her individual situation and the specific progress desired. The student's studies will lead to some kind of public performance. (F,SP) Rosenak

150G. Guitar Performance. (2) Course may be repeated for credit. Minimum of two hours of studio per week. Prerequisites: Music majors only. By audition, for experienced guitarists. The program will include ensemble work in addition to the study of solo repertoire. The student's program will be worked out in consultation with the faculty in charge of the course. Each student's studies will lead to some kind of public performance. (F,SP) Bedrosian

150H. Early Music Performance. (1-3) Course may be repeated for credit. Minimum of one to three hours of studio per week. Prerequisites: Music majors only. By audition, for experienced performers on our own instruments. The program will include ensemble work in addition to the study of solo repertoire. The student's program will be worked out in consultation with the faculty in charge of the course. Each student's studies will lead to some kind of public performance. (F,SP) Moroney

151. Twentieth-Century Harmony. (3) Three hours of lecture per week. Prerequisites: Advanced place-
154A. Counterpoint. (3) Three hours of lecture per week.
Prerequisites: 50 and 60. A study of species counterpoint. Regular exercises required. Analysis of chorale preludes, two- and three-part inventions, canons, and fugue expositions. (SP)

155. Music Composition. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 50 and 60. A study of formal problems using contemporary composition techniques. (F,SP)

156. Studies in Musical Analysis. (3) Three hours of lecture per week. Prerequisites: 50 and 60. The study of various analytical techniques and their application to important works of music.

157A-157B. Orchestration. (3,3) Three hours of lecture, two hours of laboratory per week. Formerly 157. A study of orchestration—construction and idiomatic qualities of all the orchestral instruments which comprise the contemporary symphony orchestra followed by a study of the 18th-, 19th-, and 20th-century orchestral technique. Analysis of scores and assignments in scoring for various instrumental combinations.

158. Musical Applications of Computers and Related Technologies. (4) Three hours of lecture and four hours of laboratory per week. Basic concepts and techniques of computer-based music research, composition, and performance. Essentials of digital audio signal processing, musical acoustics and psychoacoustics, sound analysis and synthesis, musical databases, use of MIDI, computer programming for music, and computer-aided music analysis. Works from the computer music repertoire will be examined.

161A. Instrumental Conducting. (3) Course may be repeated once for credit. Four hours of class per week. Prerequisites: 51 and 61; 152 and 156 recommended. Formerly 160. A study of the basic elements of conducting: physical gesture, score reading, and score analysis. Development of skills with emphasis on conducting and rehearsal techniques applicable to orchestral literature in various languages and musical styles. Preparation of selected works for rehearsal and performance in class. Should be taken in a two-semester sequence. (F,SP) Milnes

161B. Instrumental Conducting. (3) Course may be repeated once for credit. Four hours of class per week. Prerequisites: 51 and 61; 152 and 156 recommended. Formerly 160. A study of the basic elements of conducting: physical gesture, score reading, and score analysis. Development of skills with emphasis on conducting and rehearsal techniques applicable to orchestral literature in various languages and musical styles. Preparation of selected works for rehearsal and performance in class. Should be taken in a two-semester sequence. Milnes

162. Choral Conducting. (4) Four hours of class per week. Prerequisites: 160 or consent of instructor; 152 and 156 recommended. Continued development of skills introduced in 160 with emphasis on conducting and rehearsal techniques applicable to choral literature in various languages and musical styles. Preparation of selected works for rehearsal and performance in class. Kuzma

164. Current Trends in Jazz and Improvisation-Based Musics—A Performance Workshop. (3) Course may be repeated for credit. Three hours of lecture per semester. Prerequisites: 116A and 116B, or equivalent, and audition. This is an intermediate-advanced level performance workshop in jazz-based improvisational music. Class participants will perform pieces from the repertoires of jazz artists of the 50s and 70s up through and including music by contemporary composer/performer/improvisers who have come out of the jazz tradition. Course will also cover related theory and musicianship skills that enable the performer to improvise in this idiom. (F,SP) Melford

171B. Studies in Medieval and Renaissance Music. (3) Three hours of lecture per week. Prerequisites: 49C and 75 (may be taken concurrently). A study of the music of the Middle Ages and the Renaissance. Course broken into specific focuses as may vary.

171D. The Performance of Baroque Music. (3) Three hours of lecture per week. Prerequisites: 60 and 76 (may be taken concurrently); experience playing an instrument or singing. A study of music from ca. 1600-1750 with emphasis upon performance practices and styles.

172A. Mozart. (3) Three hours of lecture per week. Prerequisites: 60 and 76 or consent of instructor.

173D. Schubert to Brahms. (3) Three hours of lecture per week. Prerequisites: 60 and 76 or consent of instructor; 61 recommended. A study of symphonic and chamber works selected from the tradition of German instrumental music that led through Schubert and Schumann to Brahms.

174C. Stravinsky. (3) Three hours of lecture per week. Prerequisites: 60 and 76 or consent of instructor; 61 recommended.

179. Topics in History, Culture, and Analysis. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 60 and 76 or consent of instructor. A seminar for upper division music majors. Topics will change each semester but will always represent a fairly narrow focus on a single issue in the history, interpretation, or social meaning of music. The course provides students with an opportunity to go deeply into one subject, to discuss their ideas in a seminar setting, and to carry out a substantial independent research project.

189. Topics in Research and Performance. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 60 and 76 or consent of instructor. A seminar for upper division music majors. The primary purpose of this course is to create an environment that can enhance the research and analysis of music with live performance. The specific topic covered will change each semester. Class time will be divided equally among: (1) historical and analytical research and analysis of recorded and live performances; and (3) in-class performance. The final project will combine scholarly work and performance in the form of a lecture-recital or collaborative creative project.

H195. Special Study for Honors Candidates in Music. (4) Course may be repeated once for credit. Independent study. Prerequisites: Restricted to seniors with a GPA of 3.3 overall and 3.5 in the major. Consent of instructor and department honors committee. Prerequisites for individual students who can demonstrate a significant and substantial knowledge of the history and repertoire of electro-acoustic music. (F) Campion

202. Seminar in Contemporary Music. (4) Course may be repeated for credit. Three hours of seminar per week. Courses in 20th-century music.

203. Seminar in Composition. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Limited to advanced students of composition. A study of relevant problems and compositional techniques of contemporary music. Original compositions required of students. Group discussion and criticism. (F,SP)

204. Studies in Musical Analysis. (4) Course may be repeated for credit. Three hours of seminar per week. The application of analytical principles to a group of compositions and the intensive study of at least one composer. Prerequisites: 154B.

205. Fugue. (4) Three hours of class per week. Prerequisites: 154B. A study of subjects, answers, counter-subjects, expositions, episodes and strettis, leading to the writing of complete fugues. Regular written assignments required.

207. Advanced Projects in Computer Music. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Consent of instructor. Designed for graduate students in music composition but open to graduate students in related fields who can demonstrate knowledge of the history of electro-acoustic music as well as significant experience with computer-music practice and research. All projects are subject to approval of the instructor. (F,SP) Campion

208. Advanced Music Perception and Cognition. (4) Course may be repeated for credit. Three hours of seminar per week. Experimental studies in music perception and cognition. Research projects required.

208B. Music in Mind. (4) Three hours of seminar per week. Research seminar dealing with what goes on in your head when you make music. Topics include conceptualization, processes of learning, retention, and recall. In the context of interaction among musicians, variation and other forms of alteration (from relatively free improvisation to formulaic composition)
with varying degrees of intentionality manifested in performances will be considered. Perception is implicated but not a central issue. (F,SP) Brinner

209. Advanced Topics in Computer Music. (4) Course may be repeated for credit. Three hours of seminar per week. Technical and musical issues in the design and development of computer-based music systems including digital signal processing for the analysis and synthesis of sound, scheduling of multiple musical processes, perceptual and cognitive models, user-interface design, reactive real-time control, and the analysis and representation of musical structure.

210. Graduate Seminar: Composers and Improvisers. (1) Course may be repeated for credit. Three hours of workshop per week. Prerequisites: Admission by instructor. This course will provide a weekly forum for the exploration of strategies for composing for improvisers and improvising for composers, culminating in the presentation of new work. A number of approaches including gaming strategies, graphic and alternative notation systems, conduction, and a variety of other topics of interest to the students will be explored through performance, listening, analysis, and discussion. (F,SP) Mellord

213. Seminar: Studies in the 16th Century. (4) Course may be repeated for credit. Three hours of seminar per week. A highly specialized study of 16th-century music. The topic will change each time the course is offered.

214. Musical Applications of CNMAT Technologies. (1) Six hours of lecture/practical laboratory per week for two weeks. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. This hands-on course will expose students to musical tools developed by the Center for New Music and Audio Technologies (CNMAT). Topics include performative and compositional applications of current research at CNMAT, interactive video and audio systems, diffusion, high-level control, and network applications. (F,SP)

216. Seminar: Studies in Baroque Music. (4) Course may be repeated for credit. Three hours of seminar per week. A highly specialized study in Baroque music. The topic will change each time the course is offered.

217. Seminar: Studies in Classical Music. (4) Course may be repeated for credit. Three hours of seminar per week. A highly specialized study in Classical music. The topic will change each time the course is offered.

218. Seminar: Studies in Romantic Music. (4) Course may be repeated for credit. Three hours of seminar per week. A highly specialized study in Romantic music. The topic will change each time the course is offered.

219. Seminar: Jazz. (4) Course may be repeated for credit. Three hours of seminar per week. A highly specialized study of jazz. The topic will change each time the course is offered.

220. Topics in Music History and Criticism. (4) Course may be repeated for credit. Three hours of seminar per week. A specialized course in music history and criticism. The topic will change each time the course is offered.

240. Historical Readings in Ethnomusicology. (4) Three hours of seminar per week. Formerly 230. Critical analysis of historical sources for ethnomusicological research and focus on the historical construction of the musical “Other.” Brinner, Guilbaut, Wade

241. Readings in American Musical Cultures. (4) Three hours of seminar per week. Formerly 231. Study of selected American musical cultures in relation to issues and theories pertinent to them.

242. Ethnomusicology Analysis Seminar. (1) Course may be repeated for credit. One hour of seminar per week. Prerequisites: Consent of instructor. Critique of published analyses and approaches to analysis in various musical traditions. Students present analyses based on their individual areas of specialization.

243. Transcription and Analysis in Ethnomusicology. (4) Three hours of seminar per week. Formerly 234. Methods and practice of transcription applied to selected musical practices in relation to specific analytical goals. Coursework includes use of software for sound analysis and notation.

244A. Tools of Ethnomusicological Research. (4) Three hours of seminar per week. Prerequisites: 244A or consent of instructor. Introduction in design, execution, and presentation of a dissertation prospectus, and formulating a grant proposal. Focus also on issues such as representation and ethics. Students will normally take this course one semester with internship the prospectus for their doctoral dissertation.

246. Theory and Method in Popular Music Studies. (4) Three hours of seminar per week. Critical survey of the major issues raised and methodologies used in the study of popular music. Selected readings from a wide range of disciplines, including sociology, anthropology, musicology, ethnomusicology, communication, history, political science, economics, and music journalism.

247. Topics in Ethnomusicology. (4) Course may be repeated for credit. Three hours of seminar per week. Formerly 232. A highly specialized course in ethnomusicology. The topic will change each time the course is offered.

248A. Topics in Asian Music. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Formerly 248A. A highly specialized course focusing on aspects of music in Asia. The topic will change each time the course is offered.

249. Interpretive Theories and Music. (4) Course may be repeated for credit. Three hours of seminar per week. Readings on interpretive theories dealing with issues such as aesthetics, identity formation, and politics of representation, from the multiple disciplines informing the study of music. The selection of theoretical writings will change each time the course is offered.

250A. Advanced Ethnomusicological Studies. (2-4) Two to four hours of seminar per week. Forum for advanced work in students’ areas of specialization, with particular emphasis on addressing the integration of musical analysis with theoretical issues. Students set specific goals with faculty and meet as needed individually and as a group. (F,SP)

290. Colloquium. (1) Course may be repeated for credit. About five meetings per semester. Must be taken on a satisfactory/unsatisfactory basis. Meetings for the presentation of original work by faculty, visiting lecturers, and advanced graduate students. Assigned readings. In rotation members of the class will be appointed as respondents for the papers.

296. Directed Dissertation Research—Music. (1-12) One to 12 hours of independent study per week. Must be taken in conjunction with a research project, with a satisfactory grade for the Ph.D. and are directly engaged upon the dissertation. (F,SP) Staff

298. Group Special Studies. (1-8) Course may be repeated for credit. Three to four hours assigned according to units taken. Open to qualified students who have been advanced to candidacy for the Ph.D. and are directly engaged upon the dissertation. (F,SP) Staff

299. Special Study. (1-12) Course may be repeated for credit. Meets to be arranged according to units taken. Open to properly qualified graduate students for research or creative work on a particular topic. Not to serve in lieu of regular courses of instruction. (F,SP) Staff

601. Individual Study for Master’s Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for master’s degree. Meetings to be arranged according to units taken. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for master’s degree. Preparation for the comprehensive or language examinations in consultation with the field adviser. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Meetings to be arranged according to units taken. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for doctoral degree. Study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP)

Professional Courses

300. Professional Preparation for Teaching Assistants in Music. (2-4) Course may be repeated for credit. Meetings to be arranged according to units taken. Must be taken on a satisfactory/unsatisfactory basis. Special study under the direction of a staff member with emphasis on the teaching of undergraduate courses in music. (F,SP)

405. Elementary Piano. (1) Course may be repeated for credit. One hour of studio per week. Must be taken on a passed/not passed basis. Prerequisites: Restricted to music majors by audition. Two semesters are strongly recommended for music majors who lack the basic keyboard skills needed for musicianship and harmony classes. (F,SP) Staff

410. Vocal Technique. (1) Course may be repeated for credit. One hour of studio per week. Prerequisites: Restricted to music majors or those enrolled in the University Choruses and consent of instructor. Formerly 410A-B. A course in basic vocal techniques, primarily for students in the University Choruses, covering techniques of breathing, pronunciation, and articulation.

Nanoscale Science and Engineering


Overview

The Graduate Group in Nanoscale Science and Engineering (NSE) administers the Designated Emphasis (DE) in NSE. Faculty associated with the graduate programs in disciplines in the physical science departments and share an interest in the growing body of research surrounding the synthesis, characterization, fabrication, and modeling of nanostructured materials and devices.

Doctoral students in associated departments who wish to pursue an emphasis in nanoscale research can add the DE to their Ph.D. degree goals. The DE curriculum is designed to fulfill one of the required area emphases of the student’s Ph.D. program while providing opportunities for study and collaboration across the associated disciplines.

Coursework requirements include the core course, two electives, participation in a group seminar, and a nano-related thesis. Students usually apply
for the DE during their first or second year of study. For a list of participating programs and courses that are included in the curriculum, visit nano.berkeley.edu/educational/DEGradGroup.html.

Graduate Courses

C201. Introduction to Nanoscience and Engineering. (4) Three hours of lecture per week. Prerequisites: undergraduate courses in chemistry, physics, and engineering. This course includes quantum and solid-state physics; chemical synthesis, growth fabrication, and characterization techniques; structures and properties of semiconductors, polymers, and biomaterials on nanoscales; and devices based on nanostructures. Students must take this course to satisfy the NSE Designated Emphasis core requirement. Also listed as Bioengineering C280, Materials Science and Engineering C261, and Physics C201. (F,S,P) Gronsky, S. W. Lee, Wu

C203. Nanoscale Fabrication. (4) Students enrolled in C203 must take the course for a letter grade only. Three hours of lecture and one hour of discussion per week. This course covers various top-down and bottom-up approaches to synthesizing and processing nanostructured materials. The topics include fundamentals of self assembly, nano-imprint lithography, electron beam lithography, nanowire and nanotube synthesis, quantum dot synthesis (strain patterned and colloidal), postsynthesis modification (oxidation, doping, diffusion, surface interactions, and etching techniques). In addition, techniques to bridging length scales such as heterogeneous integration will be discussed. We will discuss new electronic, optical, thermal, mechanical, and chemical properties brought forth at the nanoscale. Also listed as Electrical Engineering C235. (F) Chang-Hasnain

C237. Computational Nanomechanics. (3) Three hours of lecture per week and one hour of laboratory every two weeks. Prerequisites: Graduate standing or consent of instructor. Basic mathematics foundations, physical models, computational formulations and algorithms that are used in nanoscale simulations and modelings. They include: (1) cohesive finite elements; (2) discontinuous Galerkin methods; (3) meshfree methods, partition of unity methods, and the extended finite element methods (X-FEM); (4) quasicontinuum method; (5) molecular dynamics; (6) multiscale simulations; and (6) Boltzmann method. Also listed as Civil and Environmental Engineering C237. Offered in every year. (SP) Li

C242. Computational Nanoscience. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. The multidisciplinary overview of computational nanoscience for both theorists and experimentalists. This course teaches the main ideas behind different simulation methods; how to decompose a problem into “simulatable” constituents; how to simulate the same thing two different ways: knowing what you are doing and why thinking is still important; the importance of talking to experimentalists: what to do with your data and how to judge its validity; and why multiscale methods are important and indispensable. Also listed as Physics C203. (F,S,P) Staff

290. Special Topics in Nanoscience Science and Engineering. (3) Course may be repeated for credit as topic varies. Subject to home department limitations. Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Lectures and appropriate assignments on fundamental or applied topics of current interest in nanoscience science and engineering. (F,S,P) Staff

298. Group Studies, Seminars, or Group Research (1) Course may be repeated for credit. One hour of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Required for participants in Designated Emphasis. Advanced studies in various subjects through special seminars or group research projects to be selected each year. Informal group studies of special problems, group participation in comprehensive design projects, or group research on complete problems for analysis and experimentation. (F,S,P) Staff

Native American Studies

(College of Letters and Science)

Program and Major Office: 506 Barrows Hall, (510) 642-6725

Chair: Beatrice Man, Ph.D.

Professors

Thomas J. Biosi, Ph.D.

Patricia Penn Hilden (Emerita), Ph.D.

Terry Wilson (Emeritus), Ph.D.

Assistant Professor

Beth Patole, Ph.D.

Lecturers

Joseph Myers, J.D.

J. Diane Pearson, Ph.D.

Undergraduate Major Adviser: Ms. Hopper

Group Major in Native American Studies

The Native American Studies Program exists to broaden the understanding of students interested in the history, culture, and contemporary situations of Native Peoples. The curriculum has been structured to provide courses that deal with both the historical and cultural analysis of Native American cultures and contemporary legal and social institutions that affect Native American life. The program not only stresses sound academic preparation in the classroom but also allows students the flexibility to take part in community-oriented education through field work or studies directed toward community situations and problems.

The Major

The major program in Native American studies leads to an A.B. degree. Admission to the program requires written approval from a program academic advisor who will assist in working out an appropriate course of study. Consultation with the advisor for admission into the major should be held no later than the first semester of the junior year. Students will be required to outline their academic and professional goals.

Major Requirements

Lower Division. Ethnic Studies 10AC and 11AC. Native American Studies 20A and 20B.

Upper Division. Ethnic Studies 101A, 101B, 103; Native American Studies 110; completion of three elective courses from Native American Studies 100, 101, 104, 120, 145, 149, 150, 151, 154, 155, 158, 174, 175, 178, 178AC, 182, 190; Native American Studies 197 (4 units total).

Honors Program

The Native American Studies Program provides an Honors Program leading to the A.B. degree with honors. A student must have junior standing; a 3.5 GPA overall; and a 3.5 GPA in the major. Students must have junior standing; and a GPA overall of 3.5 and in the major of 3.5. A committee of three faculty members will establish criteria and grade the project.

Honors Program

The Native American Studies Program provides an Honors Program to students majoring in Native American studies with honors. A student must have junior standing; a 3.5 GPA overall; and a 3.5 GPA in the major. To complete the degree with honors, the student will be required to undertake a research project (H195) that will be specified as an honors project and will be graded according to standards determined by the faculty as being of honors quality. A committee of three faculty members will establish criteria and grade the project.

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The Minor

Requirements: Native American Studies 110; completion of four elective courses from Native American Studies 100, 101, 104, 120, 145, 149, 150, 151, 154, 155, 158, 175, 176, 177, 178AC, 182, 190.

Lower Division Courses

R1A. Native American Studies Reading and Composition. (3) Three hours of lecture and one hour of writing workshop per week. Prerequisites: Satisfactory completion of English-Level 2. Formerly 1A. This course introduces students to the genres of Native American literature (written and oral traditions), provides historical and cultural frameworks for understanding, and interpreting Native American writings, and develops basic skills in expository and creative writing. Satisfies the first half of the Reading and Composition requirement. (F,S,P) Staff

R1B. Native American Studies Reading and Composition. (3) Three hours of lecture and one hour of writing workshop per week. Prerequisites: 1A. Formerly 1B. Course examines Native American written and oral traditions in historical and cultural contexts. Emphasis on literary interpretation and expository and analytical writing, so that students increasingly write from positions of strength. Satisfies the second half of the Reading and Composition requirement. (F)

20A. Introduction to Native American Studies. (4) Three hours of lecture and one hour of discussion per week. This course explores Native American writing and oral traditions in written and oral traditions in literature, art, dance, theatre, ceremony, and song. The place of these traditions in the contemporary day will be emphasized as creative struggles for meaningful and enriching on Indian identity in the context of colonialism. (SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Seminar format. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/failed basis. Prerequisites: R1A or R1B. Offered to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar writing setting. Freshman seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

71. Native Americans in North America to 1900. (4) Three hours of lecture and one hour of discussion per week. Formerly 71A and 71B. A survey of American history that focuses on the development, and modern nation-states. How have these peoples survived the challenges they face? And what resources and allies
tribal groups. Course will develop skills of information gathering and development of theories that structure information. (SP) Staff

120. Topics in Native American Arts. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. This course explores the practice of Native American art forms from the perspective of Native American artists and scholars. Focused on specific art forms such as dance, film, music, and other traditions, this course provides a critique of conventional understandings of the relationships of Native American cultural traditions and their place in the world of "art." (F,SP) Staff

120AC. Photography and the American Indian: Manifest Destiny, American Frontier, and Images of American Indians. (4) Three hours of lecture and zero to one hours of discussion per week. This course explores the development of photography, historical photographs of Indigenous peoples, Black Indians, and the push to win the American West. Central to the course are research methods that deconstruct stereotypical representations of Native Americans, African Americans (who either married into Native nations, were owned by Native peoples, or who joined the military to fight Native peoples), and the theories and methods that influenced photography. This course satisfies the Native American cultures requirement. (F,SP) Pearson

145. Making History/Making "Indians." (4) Three hours of seminar per week. This course explores the ways in which an invented, generic "Indian" has played a role of master narratives of U.S. history. This course will examine key themes and events constituting "our" collective historical memory. (F,SP) Staff

149. Gender in Native American Society. (4) Three hours of lecture per week. This course examines gender roles from the period before the invasion to the present. An emphasis will be placed on the ways in which contact with European gender practices transformed those prevalent in Native North American society before the conquest. (F,SP) Staff

151. Native American Philosophy. (4) Three hours of lecture per week. This course is a study of the philosophical and metaphysical aspects of Native American world views, with emphasis on systems of knowledge, explanations of natural phenomena, and relations of human beings to nature through ritual and ceremonial observances. (SP) Staff

152. Survey of Native American Tribal Government. (4) Three hours of lecture per week. Formerly 102. Analysis of the development of government and policy including political institutions, the tribal society, inter-tribal alliances, and effects of European contact. (SP) Faussett

152. Native American Literature. (4) Three hours of lecture per week. This course engages gender roles from the period before the invasion to the present. An emphasis will be placed on the ways in which contact with European gender practices transformed those prevalent in Native North American society before the conquest. (F,SP) Staff

155. Native American Medicine. (4) Three hours of seminar per week. Formerly 71. Anthropology 3, or consent of instructor. Theories of health and illness, and curing practices, including herbal medicines, ceremonies, and physical techniques, among Native American groups in North and South America. (F,SP) Staff

158. Native Americans and the Cinema. (4) Three hours of lecture per week. This course will analyze the sociological, psychological, and literary aspects of Hollywood and independent film production per week. The American Indian through the history of film. The format will include representative Indian films, lectures, and guest speakers from the movie industry. (F,SP) Staff

175. History of Native Americans in California. (4) Three hours of lecture per week. History of the Native Americans of California with emphasis on the lifeways, mores, warfare, and relations with the U.S. government. Attention will be given to the background and evolution of acculturation up to the present. (SP) Staff

176. History of Native Americans in the Southwest. (4) Three hours of lecture per week. An historical analysis of the Native American nations of the southwestern United States. (F,SP) Staff

178. Topics in Native American History. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week and one hour of discussion per week. This course explores the history of Native Americans from the point of view of Native American historians and scholars. Focused on specific periods or themes, these studies the course provides a rethread of much U.S. history as it has been conceived, set into periods, written, and taught. The chronological scope of the course begins before the European invasions and continues to the end of the 20th century. (F,SP) Staff

178AC. Africans in Indian Country. (4) Three hours of seminar per week. This seminar will explore the intersections of Native American and African American histories and communities in the context of the United States which was formerly "Indian Country." We will read historical texts, first-person accounts, fiction, and primary documents primarily from the perspective of Native American, African American, and Black-indian scholars and writers. This course satisfies the Native American cultures requirement. (F,SP) Staff

182. Native American Music. (4) Three hours of lecture per week. Focuses on the range and variety of musical forms and styles and the relationship of each to other aspects of human activity, belief, and world view. Students will be introduced to the richness of the musical expression of Native American music and the role of this expression in Native American cultural heritage. (F,SP) Staff

190. Seminar on Advanced Topics in Native American Studies. (1-4) Course may be repeated for credit as topic varies. One to four hours of individual conferences to be arranged. Prerequisites: Consent of instructor. Advanced seminar in Native American studies with topics to be announced at the beginning of each semester.

195. Senior Thesis. (4) Independent study. Prerequisites: Consent of instructor. Writing of a thesis under the direction of member(s) of the faculty. (F,SP) Staff

197. Fieldwork in the Native American Community. (1-3) Course may be repeated for credit as project varies. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor and upper division standing preferred. Individual conferences to be arranged. Supervised experiences relevant to specific aspects of the Native American community in off-campus settings. Regular individual meetings with advisor and written reports required. (F,SP) Staff

197AC. Supervised Group Study. (1-3) Course may be repeated for credit as project varies. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Advanced independent study opportunity for students who have developed research skills. Prereq- uisites: Consent of instructor. Individual conferences to be arranged. Group study on topics by students. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit as project varies. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing preferred. Individual conferences to be arranged. The individual student, with consent and guidance of an instructor, develops an independent research project for which credit will be awarded. (F,SP) Staff
Transfering into the College from other Berkeley Colleges and Schools

Current UC Berkeley students in good academic standing who wish to apply directly into a major in the College of Natural Resources at any time during the year. Visit nature.berkeley.edu to review the majors in the College of Natural Resources itself does not review the files campuswide admission criteria. The College of Undergraduate Admissions and is based on GPA. Transfer students apply through the Office of Transfer Students at 260 Mulford Hall. You may also download forms from nature.berkeley.edu. If you are accepted, you will receive email notification from the College of Natural Resources and will be eligible for transfer immediately.

Transfering into the College of Natural Resources from Off-Campus Schools and Programs

The College of Natural Resources welcomes transfer applicants to each of its undergraduate majors. Priority for transfer applicants to students with excellent preparation for a major, as transfer students are not admitted into undeclared status.

Prospective transfer applicants should carefully review the requirements for CNR majors at nature.berkeley.edu. If you wish to transfer, you must apply to CNR through the Office of Undergraduate Admissions. Visit students.cnrteaching@berkeley.edu for referral to a major adviser or for general advice or assistance.

Transfer applicants will be evaluated on the basis of the strength of their academic preparation, including the number of fulfilled requirements for the major to which they have applied, the GPA in the required courses, and their cumulative GPA. Transfer students are strongly encouraged to discuss their plans with an academic advisor who can be referred to by the Office of Undergraduate Admissions. Visit students.cnrteaching@berkeley.edu for more information about how to apply.

Undergraduate Majors

Since its origin as one of the cornerstones of the University of California, the College of Natural Resources has developed multidisciplinary programs that encompass the physical, biological, and social sciences, with a strong commitment to undergraduate teaching. The college offers undergraduate programs and the faculty participates in numerous interdisciplinary graduate groups.

Freshman Applicants

Undergraduate admission is directed by the Office of Undergraduate Admissions and is based on campuswide admission criteria. The College of Natural Resources does not review the major of the College of Natural Resources to see if one of its programs is right for you. Students are accepted into a major, but the College of Natural Resources’ undeclared option may also be selected. Send an email to cnrteaching@berkeley.edu if you need further advice or assistance.
Molecular Environmental Biology (MEB) introduces students to the organization and function of biological organisms at the molecular, cellular, and organismal levels, and provides an understanding of the means in which organisms function in their environment. This major is a good choice for pre-med and pre-vet students, for students interested in education in a biological area, as well as students interested in general biology. Offered by the Department of Environmental Science, Policy, and Management (ESPM); visit espm.berkeley.edu.

Molecular Toxicology (MOL TOX) focuses on the hazardous and beneficial effects of natural and man-made toxic agents. From industrially produced environmental contaminants and designer drugs to naturally occurring herbs and food products, this field applies molecular and computational methods so that students better understand how these agents interact with living organisms and what should be done to ensure human health and safety. Offered by the Department of Nutritional Science and Toxicology (NST); visit nutrition.berkeley.edu.

Nutritional Science (NS) has two areas of specialization: physiology and metabolism (metabolic biology) and didactic training program in dietetics. Physiology and metabolism courses include a foundation in natural sciences with advanced coursework in nutrition, the study of nutrient utilization, and food science. Dietetics students at the junior and senior levels take courses in nutrition emphasizing nutrition and the application of this knowledge through didactic practice. Offered by the Department of Nutritional Science and Toxicology (NST); visit nutrition.berkeley.edu.

Major Requirements. Detailed course requirements for each major, along with college requirements for the B.S. degree, are available from the Office of Instruction and Student Affairs, University of California, Berkeley, 260 Mulford Hall #3100, Berkeley, CA 94720-3100. For further information, contact the Office of Instruction and Student Affairs at (510) 642-0542; nature.berkeley.edu; or cnreteaching@berkeley.edu.

Minor Programs. The college offers minors in conservation and resource studies (ESPM), environmental economics and policy (ARE), forestry (ESPM), nutritional science (NS&T), and toxicology (NS&T). For information, contact the appropriate department.

Undergraduate Advisers. Undergraduate advisers in each major maintain a crucial link between students and the college. Advisers are available throughout the year to assist students in planning a program best suited to their needs and interests. All students must see their adviser at least once each semester for advice in planning their academic programs.

Tele-BEARS Registration. Students must have adviser approval before filing their Tele-BEARS registration lists. The minimum course load is 13 units, and the maximum is 19.5. Exceptions require: (1) an employment verification form on file, (2) a part-time status form on file, or (3) authorization from the dean’s office.

Graduate Programs

Academic and professional graduate degree programs available in the College of Natural Resources are listed below.

Inquiries regarding details of the various graduate programs may be directed to the appropriate graduate adviser.

Ad Hoc Interdisciplinary Doctoral Program Administered by the dean of the Graduate Division

Agricultural and Resource Economics

207 Giannini Hall, (510) 642-7238
Head Adviser: Peter Berck, Ph.D.

Environmental Science, Policy, and Management

137 Mulford Hall, (510) 643-2626
Head Adviser: Claire Kremen, Ph.D.

Forestry (M.F.)

133 Mulford Hall, (510) 642-6410
Head Adviser: Kevin O’Hara, Ph.D.

Microbiology

111C Koshland Hall, (510) 642-5167
Head Adviser: Patricia Zambryski, Ph.D.

Molecular and Biochemical Nutrition

124 Morgan Hall, (510) 643-2863
Head Adviser: Joseph Napoli, Ph.D.

Molecular Toxicology

124 Morgan Hall, (510) 643-2863
Head Adviser: Leonard Bjeldanes, Ph.D.

Plant Biology

111E Koshland Hall, (510) 642-5167
Head Adviser: Patricia Zambryski, Ph.D.

Range Management (M.S.)

133 Mulford Hall, (510) 642-6410
Head Adviser: Barbara Allen-Diaz, Ph.D.

Organizational Units

Agricultural and Resource Economics

Department Office: 207 Giannini Hall, (510) 643-2626
Chair: Brian Wright, Ph.D.

Environmental Science, Policy, and Management

Department Office: 140 Mulford Hall, (510) 642-5167
Chair: Ronald Amundson, Ph.D.

Environmental Sciences

Department Office: 260 Mulford Hall, (510) 642-0542
Co-Director: Stephen Welter, Ph.D.
Co-Director: Mathias Konodoff, Ph.D.

Nutritional Science and Toxicology

Department Office: 119 Morgan Hall, (510) 642-6490
Chair: Joe Napoli, Ph.D.

Plant and Microbial Biology

Department Office: 111K Koshland Hall, (510) 642-5167
Chair: Brian J. Staskawicz, Ph.D.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for 10 weeks. Two hours of seminar per week per unit for 8 weeks. Sections 1-8 to be graded on a letter-grade basis. Sections 9-16 to be graded on a pass/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: Consent of instructor.

First-year seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

Near Eastern Studies

(College of Letters and Science)

Department Office: 250 Barrows Hall, (510) 642-3757 neareastern.berkeley.edu
Chair: Carol Redmount, Ph.D. (until September 2011); then Margaret Larkin, Ph.D.

Professors

Robert B. Alter (The Class of 1937 Professor of Hebrew and Culture; Ph.D. University of California, Berkeley; Hebrew literature, modern and biblical

Daniel Boyarin (The Herman P. and Sophia Taulman Professor of Talmudic Culture; Ph.D. Jewish Theological Seminary. Cultural studies in Talmud and Midrash; gender and sexuality; hermeneutics; ancient Judaism and Christianity

Ronald S. Hendel (The Norma and Sam Dabby Professor of Hebrew Bible and Jewish Studies; Ph.D. Harvard University. Ancient Hebrew language, literature, religion, and culture

Associate Professors

Shahram Aliakbar, Ph.D. University of California, Los Angeles. Persian literature and literary history


Carol A. Redmount, Ph.D. University of Chicago. Egyptian archaeology and culture, Syro-Palestinian and biblical traditions

Niek Veldhuis, Ph.D. University of Groningen, The Netherlands. Ancient Mesopotamian languages and cultures

Assistant Professor

Benjamin Porter, Ph.D. University of Pennsylvania. Near Eastern archaeology

Lecturers

Ruthe Adler, M.A. University of California, Berkeley; M.A. San Francisco State University. Linguistics, Hebrew linguistics, English as a second language, Hebrew as a second language

Ayila Afiq, M.A. University of California, Berkeley. Turkish language and literature, language pedagogy

Hatem Bazian, Ph.D. University of California, Berkeley.

Assistant Professor

Asmaa Bzri, M.A. University of California, Berkeley. Arabic language, literature

Chava Boyarin, M.A. Hebrew University; M.A. City University of New York; Diploma in Applied Linguistics, Hebrew University, Jerusalem. Modern and biblical Hebrew

John J. Hayes, Ph.D. University of California, Los Angeles. Semitic linguistics, Arabic, Akkadian, and Sumerian

David Larkin, B.A. University of California, Berkeley. Egyptian, Coptic

Sanjoy Mehendale, Ph.D. University of California, Berkeley. Near Eastern archaeology, Central Asia

Laurie Pearce, Ph.D. Yale University. Akkadian, Assyriology, Cuneiform

Jaleh Pirmazak, Ph.D. University of California, Berkeley. Modern Iranian history, Persian language and literature, Iranian cinema

Sonia S’hir (Coordinator, Arabic Language Program), Ph.D. University of Edinburgh. Arabic language and literature

Department Overview

Instruction in the Department of Near Eastern Studies is concerned with the languages, literatures, and civilizations of the ancient, medieval, and modern Near East. The department offers spe-
cialized training in archaeology, art history, Assyriology, Egyptology, Iranian studies, Judaic and Islamic studies, comparative Semitics, Turkish, Hebrew, and Persian. For students in other disciplines, the department provides a wide variety of courses to supplement such related fields as anthropology, linguistics, art history, history, political science, and literature, and abroad. Lecture courses offered by the department present a comprehensive body of information on past and present Near Eastern civilizations. Many of the courses taught in the department are restricted to a small number of students and thus afford an opportunity for close interaction with the instructing staff.

For a description of interdisciplinary graduate programs in which the department participates, see the Graduate Education section of this catalog.

Cooperative arrangements between the University and the nearby Graduate Theological Union enable students in the department to use the extensive library holdings of the Union and supplement their programs with selected courses in Palestinian archaeology, Biblical studies, and Semitic epigraphy and philology.

The Majors

Note: NES 10 is required for all majors in the department. All courses used to meet the major or graduate degree major requirements must be at least 3 units and taken for a letter grade.

The Major in Near Eastern Languages and Literatures

Major guidelines for each discipline are available in the department office. With the consent of the department, portions of the requirements may be fulfilled by related courses in other departments.

Arabic, Hebrew, and Persian. Required: the elementary courses in the language, or their equivalents. It is recommended that these be taken beginning in the freshman year.

The major requires NES 10 and 24-28 units in upper-division language and literature courses (taught in the language) and upper-division NES courses (taught in English).

Egyptology. The major requires NES 10 and 30 units in upper-division language and lecture courses.

The Major in Ancient Egyptian and Near Eastern Art and Archaeology

Ancient Near Eastern Art and Archaeology. NES 10 and 15 are required. NES 18, 25, and Anthropology 2 are recommended. Students must complete eight upper division courses from a list of courses in the department office. If, and only if, the courses listed are not available during the students’ junior and senior years, the students may select any language or lecture course in the field of ancient Near Eastern studies with the approval of the undergraduate adviser.

Egyptian Art and Archaeology. This emphasis requires that students take NES 10, 18, 102A-102B, and Egyptian 100A-100B, 101A-101B. NES 15 and Anthropology 2 are highly recommended. In addition, students must take two upper division courses from a list available in the department office. Some background in French, German, and/or Arabic is recommended.

The Major in Near Eastern Civilizations

Ancient Near Eastern Civilizations. This emphasis requires NES 10; one course from NES 15, 18, 25, or 34; and eight upper division courses from a list available in the department office. Up to two courses on the list for Islamic civilizations may be substituted with the approval of the NES department undergraduate adviser.

Islamic Civilizations. NES 10 is required. NES C26 and C92 are recommended. Students must complete nine upper division courses in the areas of religion, history, and culture, arts and literature, Ancient Egyptian, and Near Eastern languages, from a list available in the department office. Up to two courses on the list for ancient Near Eastern civilizations may be substituted with the approval of the NES undergraduate adviser.

Honors Program

With the consent of the undergraduate adviser, a student with a GPA of 3.5 or higher in courses completed in the major may apply for admission to the Honors Program. The requirements of this program include the completion of the honors thesis in the senior year. For a complete description of the program, contact the department office.

The Minors

In each of the language minor programs, Option A is open to students with little or no background in the language. Option B is for students who have completed the equivalent of two years of university-level coursework in the language.

The Minor in Arabic, Option A. Required courses: Arabic 20A-20B (in addition to Arabic 1A-1B). Five upper division courses: Arabic 100A; two one-semester literature courses (in Arabic); two one-semester courses in Arabic culture/history. Option B. Required courses: Seven upper division courses: five one-semester courses in Arabic language and literature (in Arabic); two one-semester courses in Arabic culture/history.

The Minor in Hebrew, Option A. Required courses: Hebrew 20A-20B (in addition to Hebrew 1A-1B). Five upper division courses: Hebrew 100A-100B, 104A-104B; a one-semester course in Hebrew culture/history.

The Minor in Hebrew, Option B. Required courses: Seven upper division courses: five one-semester courses in Hebrew language or literature (in Hebrew); two one-semester courses in Hebrew culture/history. Option C. Required courses: Hebrew 101A-101B; a one-semester course in Jewish Studies.


The Minor in Turkish, Option A. Required courses: Turkish 1A-1B. Five upper division courses: Turkish 100-100B, 101A-101B, or 102A-102B; a one-semester course in Turkish culture/history.

The Minor in Turkish, Option B. Required courses: Seven upper division courses: five one-semester courses in Turkish literature (in Turkish); two one-semester courses in Turkish culture/history.

The Minor in Ancient Egyptian and Near Eastern Civilizations. Required courses: NES 15 or 18, and five semesters of upper division courses chosen from a list available at the department office. NES 25 and 34 are recommended.

Graduate Programs

Graduate programs leading to the M.A. and Ph.D. degrees are offered in Near Eastern languages and literatures: Arabic, Hebrew, and Persian. The same degrees are also offered in the following fields of Near Eastern studies: archaeology, art history, Semitic and Biblical, ancient Near Eastern languages, Semitic languages, comparative Semitics, Egyptology, and Islamic studies.

Graduate Degrees

Applicants for graduate study should have fulfilled the equivalent of the department requirements for the A.B. in their proposed area of study. The department encourages its own graduate students to take advantage of courses in other departments that are relevant to their disciplines and fields of study. Upon approval by the graduate adviser, such courses may be recognized as fulfilling portions of the department coursework requirements for graduate degrees.

The M.A. Degree. The M.A. is obtained according to the Graduate Division’s Plan II. A complete description of Graduate Division requirements for this degree is found in the Graduate Education section of this catalog. In addition to the requirements outlined for Plan II, students must pass a reading examination in either French or German (another language may be substituted on approval of the major adviser).

Plan II requires at least 24 units of coursework. For students in the language programs, at least 12 of their 24 units must be in 200-series courses in the major and three semesters of work in a Near Eastern language other than the student’s major language. For students in archaeology and art history programs with a Near Eastern emphasis, at least 12 of the 24 units must be in 200-series courses and three semesters must be drawn from NES 220A-220B and 223A-223B. For students in archaeology and art history programs with an Egyptian emphasis, at least 12 of the 24 units must be in 200-series courses, and the required 24 units must include two one-semester courses in the ancient Egyptian language beyond the second-year level. The 12-200 series units must be from seminar courses (one 200-level Egyptian language may be from a seminar course that is also included in another requirement). Two scholarly papers written independently or in connection with coursework will also be required. Written comprehensive examinations are required of all students to test: (a) working knowledge of pertinent languages; (b) general knowledge of the history and civilization of area of emphasis; and (c) knowledge of other subjects suggested by the student’s degree committee.

The Ph.D. Degree. Students must have completed the M.A. in Near Eastern Languages and Literatures to be eligible for the Ph.D. program. Admission to candidacy for the Ph.D. degree depends on successful completion of the following requirements:

(1) Ph.D. coursework.

(2) Reading examinations in French and German. (Proficiency in a European or other modern language other than the student’s field of emphasis may be substituted on approval of the graduate adviser and the student’s advisory committee.)

(3) Proficiency in one or two Near Eastern languages, as required for the student’s field of study. (For language majors, proficiency will be tested through the written proficiency, which will cover at least two Near Eastern Languages. For Egyptian archaeology and art history majors, proficiency will be tested through examination in

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R & C requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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about the courses offered by the Department of taught in English. Courses listed under language are faculty for this program. See the AHMA section.

Jewish Studies of the Graduate Theological Union

cants will be admitted into both the Center for approaches will be strongly encouraged. Appli-
ments. Also listed as Religious Studies C103.

Barrows Hall. For further information on these graduate pro-
grams, contact the graduate assistant in 250

Special Programs

The Joint Doctoral Program in Near Eastern Religions. This program, which combines the fac-
ty and resources of the University of Calif-
ona, Berkeley, and the Graduate Theological Union, is a flexible course of study, probing in depth the archaeology, history, languages, litera-
ture, and thought patterns of the ancient Near East and Egypt, with emphasis on the various forms of religious expression indigenous to their cultures. Applicants must have the Ph.D. degree as their goal. They should possess an M.A. or the equivalent in Near Eastern studies or a related field and should have proficiency in two appropriate ancient languages equivalent to that obtainable through an undergraduate degree in those languages. Applicants must be admitted to both the Gradu-
ate Theological Union and the University of Calif-
ona, Berkeley; the degree is conferred jointly by both institutions.

Joint Doctoral Program in Jewish Studies. This program is open only to students who intend to work toward the Ph.D. degree. Students must acquire professional competence in a historical period and a disciplinary focus, and interdisciplinary approaches will be strongly encouraged. Applic-
ants will be admitted into both the Center for Jewish Studies of the Graduate Theological Union and the University of California, Berkeley. The degree is conferred jointly by the two institutions.

The Graduate Program in Ancient History and Mediterranean Archaeology. This program is available to students with backgrounds in ancient history and archaeology. The ancient studies fac-
ulty of the Department of Near Eastern Studies are faculty for this program. See the AHMA section in this catalog for a full description of this program.

Near Eastern Studies

Courses listed under Near Eastern studies are taught in English. Courses listed under language headings are in that language. Topics vary.

Egyptian and/or Coptic which must be completed and passed no later than the semester before the student’s qualifying examination. Archaeology and art history students (except those in Egyptian archaeology) who have not completed a mini-
mum of two years of coursework in an ancient or modern Near Eastern language must pass a pro-
ficiency examination in an ancient or modern Near Eastern language before taking the preliminary examinations.)

(4) fieldwork (for art history and archaeology majors).

(5) written preliminary examination and the oral qualifying examination.

(6) a prospectus of the dissertation approved by the student’s proposed Ph.D. dissertation committee.

After admission to candidacy, the student is to fulfill the major requirements as outlined in the Graduate Education section of this catalog.

For further information on these graduate pro-
grams, contact the graduate assistant in 250

Lower Division Courses

R1A-R1B. Reading and Composition in Near East-
ern Studies. (4;4) Three hours of lecture and one hour of conference per week. Prerequisites: UC Entry-
Level Writing requirement or UC Analytical Writing Placement Exam. 1A is prerequisite to 1B. Exposi-
tory writing based on analysis of selected texts or lit-
ratures in translation or writings interpreting the material culture of the ancient Near or modern Middle East. Specific topics vary. A. Must be taken in the first half of the Reading and Composition require-
ment, and R1B satisfies the second half. (F,SP)

10. Introduction to the Near East. (4) Three hours of lecture and one hour of discussion per week. The ancient Near East (present-day Iran, Iraq, Syria, Jordan, Lebanon, Israel, and Turkey) is considered the cradle of civilization. Here in Mesopotamia and its neighboring regions, the first cities arose, writing was invented, armies forged the earliest empires, religions were born, various beliefs were expressed in art and architecture. This course surveys the major archaeological sites and monu-
ments from the earliest settlements to the conquest of the Near East by Alexander the Great in 330 BCE. (F,SP) Feldman

18. Introduction to Ancient Egypt. (4) A general introduction to ancient Egypt, providing overview cov-
erage of ancient Egyptian culture and society (his-
tory, art, religion, literature, language, social structure), Egyptian archaeology (tombs, mummies, temples, cities, monuments, daily life), and the his-
tory and development of the modern discipline of Egyptology. Assumes no prior knowledge of subject. A. Three hours of lecture per week. B. The Middle and New Kingdoms. Discussion sections are held in the Phoebe Hearst Museum of Anthropology, which has the best collection of ancient Egyptian artifacts west of Chicago. (F,SP)

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportu-
nity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman sem-
inars are offered in all campus departments, and topics vary from department to department and semester to semester.

C26. Introduction to Central Asia. (3) Three hours of lecture per week. Formerly 26. This course will intro-
duce the student not only to ancient and modern Cen-
tral Asia, but also to the role played by the region in the shaping of the history of neighboring regions and regimes. The course will outline the history, languages, ethnicities, religions, and archaeology of the region and will acquaint the student with the historical foun-
dations of some of the political, social, and economic challenges for contemporary post-Soviet Central Asian republics. Also listed as Geography C55.

98. Directed Group Study for Lower Division Stu-
dents. (1-4) Course may be repeated for credit. Enroll-
ment is restricted; see the Introduction to Courses and Curricula section of this catalog. One contact hour per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing. Student must submit a written proposal with consent of instructor to the department chair for approval. Topics vary. (F,SP)

99. Supervised Independent Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One contact hour per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing; 3.3 GPA and consent of instructor. Students must submit a written proposal to the chair of the department for approval. Topics vary.

Upper Division Courses

102A-102B. Archaeology of Ancient Egypt. (4;4) Three hours of lecture and one hour of museum sec-
ction per week. Prerequisites: 1B or equivalent or con-
sent of instructor. A survey of the archaeological mate-
rial culture of the ancient Egyptians, based primarily upon the written sources. (F,SP)

C103. Religion of Ancient Egypt. (3) Three hours of lecture per week. Prerequisites: 18 or consent of instructor. A survey of the religious beliefs of the ancient Egyptians, based primarily upon the written sources. (F,SP)

C104. Babylonian Religion. (3) Three hours of lecture per week. A survey of Babylonian religious beliefs and practices based on indigenous texts and monu-
ments. Also listed as Religious Studies C104.

105A. Ancient Mesopotamian Documents and Lit-
ture. Three hours of lecture per week. A repre-
sentative survey of original third-first millennium Cuneiform texts in translation.

A. The Sumerian religious and scholastic tradition; myths of creation, hymns, epics and early historical material.

B. Assyrio-Babylonian historical and legal documents and art, and royal correspondence; kingship and the cult; divination, astrology and magic; the classic literary works.

106A-106B. Art and Architecture of Ancient Egypt. (4;4) Three hours of lecture and one hour of discussion per week. Prerequisites: A. 18 or equivalent, or con-
sent of instructor. B. 106A or consent of instructor. Stylistic and iconographic study of Egyptian art and architecture from Predynastic times through the end of the Pharaonic period. Discussion sections will focus on Egyptian material in the Hearst Museum collection.

A. Will cover the period from Predynastic times until the end of the First Intermediate period (ca. 5000-
2000 BC).

B. Will consider the period from the end of the First Intermediate period through the Graeco-Roman period (ca. 2000 BC-first century AD).

108. Topics in the Ancient Mediterranean World. (2-
4) Course may be repeated for credit as topic varies. Three hours of lecture or seminar per week. Three units awarded when course is given as a lecture course. 4 units are given when course is given as a seminar and the student completes a seminar paper; 2 units are given as a seminar and there is no seminar paper. Prerequisites: Consent of instructor. Varying topics in the cultural connections of the ancient Mediterranean world from the fourth millennium B.C.E. to latinitas antiquitatis. Typical themes might include ideologies of gender and sexuality; comparative reli-
gions or literatures; archaeological and/or historical interconnections. (F,SP)

109. Mesopotamian History. (3) Three hours of lecture per week. Ancient Mesopotamian political, cul-
tural, social and economic history from the invention of script to the Persian conquest of Babylon will be presented in survey, and one topic will be selected for in-
depth study.

110. Art and Archaeology of Ancient Egypt in the First Millennium B.C. (3) Three hours of illustrated lecture per week. Prerequisites: 18 or equivalent or consent of instructor. The course surveys the art and/or archaeology of ancient Egypt in the first mil-
lenium B.C. It covers ancient Egyptian material cul-
112. Survey of Ancient Egyptian History. (4) Students will receive no credit for 112 after taking 101A-101B, 2 units after taking 101A or 101B. Three hours of lecture and one hour of discussion per week. Prerequisites: 10 or 18 recommended. A concise survey of Ancient Egyptian history from Predynastic times to the Conquest of Alexander the Great. This course provides a general survey of the archaeology of the Southern Levant (Israel, Jordan, Lebanon, Southern Syria, Palestine) from Natufian through Persian times. The material culture of the region is emphasized, along with the major theoretical and interpretive approaches and issues affecting our understanding of the archaeological record.

126. Silk Road Art and Archaeology. (3) Three hours of lecture per week. The course will outline art and archaeology of the Silk Roads from the first century BCE to the 12th century. A number of specific sites along the Silk Roads will be selected and explored in depth, as examples which reveal the manifold cultural currents along the trade routes. Special attention will be devoted to the evolution of artistic traditions in Silk Road cultures brought about by the movement of peoples and merchandise which facilitated the spread and fusion along these trading routes of various ideas, materials, and cultural forms. Through weekly discussion of social and political underpinnings of this eclecticism will be examined.

C129. Minoan and Mycenaean Art. (3) Three hours of lecture and one hour of discussion per week. This course analyzes the art, architecture, and archaeology of prehistoric Greece, concentrating on the Minoan and Mycenaean palatial arts of the Bronze Age (3000-1200 BCE). The evocative yet still enigmatic remains of palaces and funerary complexes, frescoes and vases, monumental sculpture, and jewelry will be closely examined in terms of their forms and cultural contexts. The place of prehistoric Greece in the interna
tional world of the eastern Mediterranean will also be explored. Also listed as Art C129F. (FSP) Porter

C120A. The Art of Ancient Mesopotamia: 3500-1000 BCE. (4) Three hours of lecture and one hour of discussion per week. The course will examine the art and architecture of early Mesopotamia will be explored in the terms of the social, political, and cultural context of the ancient Near Eastern history, concentrating on the contemporary Sumerian, Babylonian, and Assyrian periods. A. course will provide an overview of the history of the region, the main political and cultural developments, and the major archaeological sites.

C120B. The Art of Ancient Mesopotamia: 1000-330 BCE. (4) Three hours of lecture and one hour of discussion per week. This course will provide an overview of the history of Mesopotamia and neighboring regions from 1000-330 BCE with an emphasis on the development of visual narrative, the role of art in expressing the authority and legitimacy of the empires, and the diverse artistic traditions of the region.

132. Biblical Poetry. (4) Three hours of lecture and one hour of discussion per week. A survey of the poetic tradition of the Hebrew Bible, focusing on close reading of selected texts. Theoretical issues will include the dynamics of parallelism, metaphor, intertextuality, and gender. Historical issues will include the ancient Near Eastern literary genres and their role in the construction of identities. The course will also be read as a way of understanding the development of the biblical poetry. Primary texts will be largely drawn from the books of Psalms, Proverbs, Job, Ecclesiastes, Song of Songs, and the prophetic books.

133. Judaism in Late Antiquity. (4) Three hours of lecture and one hour of discussion per week. This course will examine the emergence and development of classical Judaism, its piety, institutions, thought, and literary features. Also listed as Religious Studies 113 and Undergrad Interdisciplinary Studies C153.

135. Jewish Civilization I: The Biblical Period. (3) Three hours of lecture and one hour of discussion per week. This course will introduce students to the history of Israel, the formation of the Hebrew Bible, and the development of Israelite religion in the context of ancient Near Eastern intellectual currents. The course will explore the current state of our knowledge, including the legacy of ancient Near Eastern mythology and religion, the history of Israelite religion, the literary features of biblical narrative, and the Dead Sea Scrolls. Also listed as Religious Studies C132.

136. History and Historiography in the Hebrew Bible. (3) Three hours of lecture per week. A critical examination of the form and content of history-like narratives in the Hebrew Bible in the light of contemporary concepts of history and historiographic practices in the ancient Near East and in contemporary historical studies. Selective focus on one or more books in Genesis through Judges or Chronicles. The course will be offered as an independent study course in consultation with the instructor.

139. Modern Jewish Literatures. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Upper division standing or consent of instructor. Trends and genres in modern Jewish literatures—translated from Hebrew and Yiddish, with selected texts also translated from other Jewish languages like Ladino and Judeo-Arabic. Focus will be on developments in Jewish literary traditions since the Enlightenment in the context of other medieval and European cultural forms and the tensions in the development of the modern Hebrew language. The course is taught in English. Knowledge of Hebrew is desirable but not required.

140. Topics in Islamic Thought and Institutions. (3) Course may be repeated for credit. Three hours of lecture per week. Selected topics from Islamic intellectual history.

142. Islamic Civilization. (3) Three hours of lecture per week. The beliefs, traditions, and practices of the Shi'ite school of Islam.

143A-143B. Islam in Iran. (3) Three hours of lecture per week. A general survey of the history of Islam in Iran, focusing on the rise and development of religious institutions, the elaboration of the religious sciences, Sufism, and sectarian movements.

144. Sufism: The Mysticism of Islam. (3) May be repeated for credit when subject matter varies. Three hours of lecture per week. A general presentation of Sufism that, while not aiming at exhaustiveness, will seek to acquaint students with the place and function of Sufism in Islam; the main outlines of its history; doctrinal and ritual features; the relationship between Sufism and literature, especially poetry; the principal Sufi sources; and the leading figures in the history of Sufism as a distinct mode of Islamic practice; and the great diversity of Sufism as reflected in its geographic spread throughout the Muslim world.

146A-146B. Islam. (3,3) Three hours of lecture per week. A comprehensive and detailed introduction to Islam. The course will examine the historical development and elaboration in a select number of ethnic and geographic environments and an overview of Islam in the Near East.

147. The Rise of Islamic Civilization. (4) Three hours of lecture and one hour of discussion per week. A survey of Islamic civilization in the Middle East during the Medieval period. Topics include the emergence of Islam in Arabia and the role of the Prophet Muhammad, the rapid rise of the first Islamic empire and its effects on the societies it governed; the creation of an Islamic civilization and the religious, political, and intellectual debates and controversies which emerged; contact with Europe and Asia and the spread of Islam; the transference of Islamic culture to the Far East; and the contributions of non-Muslims, women, slaves.

155. Wonder and the Fantastic: The Thousand and One Nights in World Literary Imagination. (3) Three hours of lecture per week. After studying the tales themselves and examining their structure and how they fit into the genre of folk literature, we will investi
gate how the Nights was transmitted, translated, and received in Europe, as a window on 19th-century European culture and intellectual currents.

160. Religions of Ancient Iran. (3) Three hours of lecture per week. Principally devoted to Zoroastrianism and Manicheanism but with some attention to Indo-Iranian origins and figures in the ancient religion for the history of Hellenistic Gnosticism, Judaism, and Islam.

162A-162B. History of Persian Literature. (4,4) Three hours of lecture and one hour of discussion per week. These courses offer a comprehensive intro
duction to the main currents in Persian literature from the 8th century to the present. They introduce students to various genres, period styles, and crucial formal and thematic elements necessary to the understanding of Persian literature. While 162A deals with the classical period, 162B deals with the post-classical period of Persian literature since the advent of modernity in Persian-speaking lands, namely the 19th century. Both courses emphasize the impact of social factors, gender and race, and intellectual currents on the Persian literary production. The course is taught in English.

175. History and Culture of Afghanistan. (3) Three hours of lecture per week. This course will discuss Afghanistan from ancient times to the present, includ
ing the emergence of Afghanistan as a modern nation-
state and its geo-strategic importance. The Soviet
invasion and aftermath will be emphasized, along with issues of state and society, ethnic diversity and tribal structure, challenges of modernization, and nationalism and gender roles in Near Eastern civilizations. The syllabus and the role of the arts, music, and literature will also be discussed.

190. Special Topics in Fields of Near Eastern Studies. Course may be repeated for credit. Three hours of lecture per week. Topics explore themes and problems in the various fields of Near Eastern studies. They reflect the research interests of the instructor and supplement regular curricular offerings. Specific descriptions of current offerings in this series are available through the department.

190A. Ancient Near Eastern Studies. (4)
190C. Jewish Studies. (4)
190D. Islamic Studies. (4) (F,SP)
190E. Arabic. (4)
190G. Egyptian. (4)
190H. Turkic. (4)

192. Undergrad Seminar: Problems and Research in Near Eastern Studies. (2-4) Course may be repeated for credit. Three hours of seminar plus extensive outside work. Prerequisites: Consent of instructor. This series is designed to acquaint upper division students with advanced research strategies in specific areas of Near Eastern studies. The course may reflect current research and interests of the instructors and will introduce students to specialized problems in the field. 2 units for presentation; 4 units for paper and presentation.

192A. Ancient Near Eastern Studies. (2-4)

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

188. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Variable meetings. Must be taken on a passed/not passed basis. Instruction in areas not covered by regularly scheduled courses: Phoenician, Cypriot, Syrian Archaeology. (F,SP)

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations shown in this catalog. (F,SP)

Graduate Courses

200. Graduate Proseminar. (1) One to two hours of seminar per week. Introduction to the academic profession of Near Eastern studies. This course will survey the various disciplines and subfields contained under this rubric, including their developmental histories, methodologies, and primary and secondary data sources. Enrollment in this course is required of all graduate students during their first year of study.

202. Fields, Methods, and Current Trends in Ancient Egyptian and Near Eastern Studies. (2-4) Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-graded basis. Prerequisites: Consent of instructor. An introduction to the diversity of fields and disciplines that comprise ancient Egyptian and Near Eastern Studies, including current and traditional methods and trends. Designed for candidates for higher degrees in Near Eastern Studies and related programs. (F,SP) Staff

220A-220B. Seminar in Near Eastern Art. (2,4;2,4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Graduate seminar on specific aspects of the arts of Western and Central Asia. May be taken for 2 units on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-grade basis. (F,SP) Staff

223A. Seminar in Near Eastern Archaeology. (4) Course may be repeated for credit. Three hours of seminar per week. Research into a major aspect or problem of Mesopotamian archaeology.

290. Special Studies. Course may be repeated for credit. Prerequisites: Consent of instructor. Students may enroll in more than one section of 290, but the total number of units for any special study in any one semester may not exceed 12.

290A. Near Eastern Studies. (1-5) (F,SP)
290B. Arabic. (1-5) (F,SP)
290C. Cuneiform. (1-5) (F,SP)
290D. Egyptian. (1-5) (F,SP)
290E. Hebrew. (1-5) (F,SP)
290F. Iranian. (1-5) (F,SP)
290G. Semitic. (1-5)

291. Dissertation Writing Workshop. (4) Course may be repeated for credit. Two hours of workshop per week, plus one and one-half hours of writing group every other week. Prerequisites: Advancement to candidacy, limited to students engaged in research for and writing of the doctoral dissertation. A faculty member will oversee the group, offering guidance and making sure guidelines are followed. Students will manage group day-to-day operations. At least one week before each meeting a student will prepare a draft of a chapter. During the meeting, students will give feedback on the draft. This feedback will be due at the end of the semester. The workshop is open to graduate students from other departments who are writing on topics associated with Near Eastern studies. (F)

292. Museum Internship. (4) Course may be repeated for credit. Ten to 15 hours per week of curatorial work. Must be taken on a satisfactory/unsatisfactory basis. 

295. Supervised Field Research in Archaeology. (2-12) Course may be repeated for credit. Two to 12 hours of fieldwork per week. Full-time participation in an archaeological excavation or exploratory survey, preceded by three hours of seminar per week for one half of one semester, at the discretion of the instructor. Students will participate in all aspects of the operation and will be responsible for preparing a written report on some specific part of the work. Geographical areas and sites to be determined each year. Students taking the seminar only will receive 2 units only.

296. Topics in Egyptian Art and Archaeology. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-graded basis. Prerequisites: 102A, 102B or 106A-106B or consent of instructor. Changing topics involving ancient Egyptian art and archaeology. Focus may be regional, chronological, methodological, and/or thematic.

297. Topics in Ancient Ceramics of Egypt and the Levant. (2,4) Course may be repeated for credit as topic varies. Three hours of seminar per week. 2 units to be graded on a satisfactory/unsatisfactory basis. 4 units to be graded on a letter-graded basis. Prerequisites: 102A, 102B or 106A-106B or consent of instructor. Changing topics involving ancient Egyptian art and archaeology. Focus may be regional, chronological, methodological, and/or thematic.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Near Eastern studies. Topics vary and are announced at the beginning of each semester.

299. Dissertation Research and Writing. (4-12) Course may be repeated for credit. Individual conferences. Prerequisites: Advancement to candidacy, limited to students engaged in research for and writing of the dissertation. All students advanced to candidacy must enroll in 299 in every semester in which they are registered. When in residence, students are required to meet with their primary dissertation advisor at least twice a semester. Students not in residence should communicate either by phone or email with their adviser at least twice a semester. Seminar grade will be based on work turned in to the instructor to consist of at least one draft chapter of the dissertation or the equivalent. (F,SP)

601. Individual Studies for Master’s Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive examination. Must not be used to meet either unit or residence requirements for a master’s degree. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field advisor, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)

Arabic

Lower Division Courses

1A-1B. Elementary Arabic. (5,5) Five hours of recitation per week. Prerequisites: 1A is a prerequisite to 1B. This course emphasizes language development in the four language skills: listening, speaking, reading, and writing. Authentic audio, video, and reading materials are presented from the beginning, and students are encouraged to be creative with the language in and out of class.

15A-15B. Spoken Arabic. (3,3) Course may be repeated for credit if different dialect is offered. Three hours of lecture per week. Formerly 101A-101B. Practice in speaking an Arabic dialect.

20A-20B. Intermediate Arabic. (5,5) Five hours of recitation per week. Prerequisites: 20A is a prerequisite to 20B. This course is proficiency oriented. Authentic reading in modern standard and classical Arabic and the understanding and application of grammatical and stylistic rules are emphasized. Students deliver oral presentations and write academic papers in Arabic.

Upper Division Courses

100A-100B. Advanced Arabic. (3,3) Three hours of lecture per week. Prerequisites: 20B. 100A is a prerequisite to 100B. Intensive reading and analysis of texts of different genres. Guest lectures, films, documents, oral presentations, research papers, and formal and informal styles of writing and correspondence. Extensive vocabulary building.

104B. Classical Arabic Prose. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 20B or equivalent. This course is designed for students who wish to concentrate on Arabic of the classical periods of Arab and Islamic civilization. Reading and analysis of literary texts of different genres, including essays, biography, and travel literature. (F)

105B. Classical Arabic Poetry. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 20B or equivalent. Readings and analysis of poetry from the pre-Islamic through the classical periods.
Three hours of lecture per week. Prerequisites: 20B or equivalent. Readings from the classical historians and geographers and from contemporary scholarship. Development of historiography.

108. Indo-European and Semitic Languages and Literature in the Ancient Near East. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 20B or equivalent. Readings in the basic texts of Islam (Qur'an, Hadith, Midrash commentary) and in the literature and culture of the ancient and early Islamic periods.

111A-111B. Survey of Arabic Literature (in Arabic). (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A. This course is designed primarily for majors and prospective majors in Arabic studies.

A. The Classical Periods: A literary-historical survey of Arabic literature from pre-Islamic times to the middle of the 13th century, with emphasis on the more important achievements of major Arab authors.

B. The Post-Abbasid and Modern Periods: A literary-historical survey of Arabic literature from the middle of the 13th century to the present.

190. Special Topics in Arabic. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20B or equivalent. Topics explore special problems and problems in Arabic language and literature. They often reflect the research interests of their instructors. Prerequisites: regular selection of current offerings. Specific descriptions of current offerings are available through the department. (F,SP)

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Instruction in areas not covered by regularly scheduled courses.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog.

Graduate Courses

200. Arabic Grammatical Tradition. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 105 or the equivalent. Study of grammatical phenomena of Arabic based on readings from the classical Arabic grammarians, on the modern study of linguistics in the Arab world, and on the Western grammatical tradition.

202. History of Arabic. (3) Course may be repeated for credit when topic varies. Three hours of lecture per week. Prerequisites: 20B or its equivalent and consent of instructor. History of Arabic from its Semitic antecedents through the formation of the modern dialects.

209A. Readings in the Qur'an. (3) Course may be repeated for credit as texts vary. Three hours of reading per week. Prerequisites: 109 or the equivalent. Intensive study of the Qur'an, tradi-
tional Islamic exegesis, and other secondary material.

212. Topics in Modern Arabic Literature: Poetry. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 109 or its equivalent. A course in the study of modern Arabic poetry from the perspective of the poet's craft.

220. Seminar in Classical Arabic Literature. (3) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: 20B or its equivalent and consent of instructor. A close reading of the Semitic antecedents of significant authors and specific topics in classical Arabic prose or poetry or both.

245. Seminar: Modernist Arabic Poetics. (3) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. This course examines the origins, status, and function of literary theory in the making of modern

Egyptian

Upper Division Courses

100A-100B. Elementary Egyptian. (5,5) Three hours of lecture and one hour of discussion per week. Introduction to Middle Egyptian grammar and texts.

101A-101B. Intermediate Egyptian. (3,3) Three hours of lecture per week. Prerequisites: 100A-100B. Readings in Middle Egyptian hieroglyphic and hieratic texts.

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations shown in this catalog.

Graduate Courses

201A-201B. Later Stages of Egyptian. (3,3) Three hours of lecture per week. Prerequisites: 101A-101B and 102A-102B. Introduction to late Egyptian and Coptic.

202B. Egyptian Texts. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Concurrent or previous enrollment in 201A-201B or consent of instructor. Philological analysis of texts of a single genre and period.

Hebrew

Lower Division Courses

1A-1B. Elementary Hebrew. (5,5) Five hours of recitation and one hour of laboratory per week.

20A-20B. Intermediate Hebrew. (5,5) Five hours of lecture per week. Prerequisites: 1A-1B.

Upper Division Courses

100A-100B. Advanced Hebrew. (3,3) Three hours of lecture per week. Prerequisites: 20A-20B or equivalent. Advanced Hebrew, especially designed for those going on to the study of modern Hebrew literature. Vocabulary building, grammar review, and literary analysis of a sampling of modern texts.

102A-102B. Postbiblical Hebrew Texts. (3,3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 20A-20B or equivalent. Texts from the rabbinic period (Mishnah, Tosetta, Talmud, and Midrash) and an introduction to the languages of rabbinic texts.

104A-104B. Modern Hebrew Literature and Culture. (3,3) Course may be repeated for credit with different topic and consent of instructor. Three hours of lecture per week. Prerequisites: 104A-104B or equivalent. A close reading of selected works of modern Hebrew fiction, poetry, and drama in their cultural and historical contexts. Topics vary from year to year and include literature and politics, eros and gender, memory and nationalism, Middle-Eastern and European aspects of Israeli literature and culture.

105B. The Structure of Modern Hebrew. (3) Course may be repeated for credit. Three hours of lecture per week. An analysis of Hebrew grammar, syntax, semantics, morphology, history of the language, fixed expressions, discourse analysis, contrastive features of Hebrew and English in the context of contemporary linguistic theories.

Graduate Courses

190. Special Topics in Hebrew. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 20A-20B or equivalent. Topics explore special themes and problems in Hebrew language and literature. They often reflect the research interests of the instructor and supplement regular curricular offerings. Specific descriptions of current offerings are available through the department. (F,SP)

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Instruction in areas not covered by regularly scheduled courses.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations shown in this catalog.

Graduate Courses


202A-202B. Advanced Late Antiquity Hebrew Texts. (3,3) Course may be repeated for credit as text varies. Three hours of lecture per week. Prerequisites: 102A-102B. Historical and literary study of Hebrew and Aramaic Judaic texts (e.g., Talmud and Midrash).

203A-203B. Advanced Medieval Hebrew Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 103A-103B and 105A-105B. Literary analysis of belletistic Hebrew texts, either prose or poetry, chiefly from the Iberian medieval period.

204A-204B. Advanced Modern Hebrew Literature and Culture. (3,3) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Two semesters of 104A-104B or 105A, or equivalent. Critical approaches to the history and textual problems of modern Hebrew poetry and fiction. Alternating focus between period, genre, and author, seminar topics include stylistic developments in Hebrew poetry and fiction from the Enlightenment to the present, modernism and modernity, the creation of the modern Hebrew novel, women writers and the Hebrew canon, and single-author seminars.

205. Ancient and Modern Hebrew Literary Texts. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A-100B or consent of instructor. Focus on biblical texts seen from a literary point of view, attempting to establish connections with later Hebrew literature.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Hebrew. Topics vary and are announced at the beginning of each semester.

Professional Courses

301A. Teaching Hebrew in College. (3) One hour of lecture per week plus participation in demonstration classes and colloquia. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. The methodology of teaching Hebrew as a foreign language at the college level. Lectures on contrastive analysis of English and Hebrew, classroom strategies, and the development of instructional materials. Required of all new graduate student instructors in Hebrew.

Persian

Persian Lower Division Courses

1A-1B. Elementary Modern Persian. (5,5) Five hours of lecture per week. In this elementary course, students learn basic reading, writing, and conversation skills in Persian. Completion of 1A-1B is the prerequisite for 100A.

11A. Reading and Composition for Persian Speaking Students. (5) Five hours of recitation per week. Prerequisites: Rudimentary knowledge of spoken Persian and consent of instructor. Designed for students with rudimentary knowledge of the Persian language: students who have oral skills (speaking/comprehension, though limited), but lack writing and reading abilities, and grammatical and syntactic knowledge. Completion of 11A-11B will prepare the student to take Persian 100A, Intermediate Persian.

11B. Reading and Composition for Persian Speaking Students. (5) Five hours of recitation per week. Prerequisites: 11A or consent of instructor. Designed for students with rudimentary knowledge of the Persian language: students who have oral skills (speaking/comprehension, though limited), but lack writing and reading abilities, and grammatical and syntactic knowledge. Completion of 11A-11B will prepare students to take Persian 100A, Intermediate Persian.

100A-100B. Intermediate Modern Persian. (5,5) 100A is a continuation of 1A-1B. Five hours of lecture per week. Prerequisites: 1A-1B or consent of instructor. The student will further develop major skills of the language: reading, writing, speaking, and listening comprehension. (F,SP)

101A-101B. Selected Readings in Persian Literature. (3) Three hours of lecture per week. Prerequisites: 101A-101B and consent of instructor. Systematic study of representative selections from all periods of classical Persian literature, with attention to the historical and intellectual context.

102A-102B. Readings in Classical Persian Prose. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A or 101B and consent of instructor. Systematic study of prose in the classical Persian literary tradition, including all genres of classical Persian poetry, with considerations of questions of prosody, rhetoric, and style.

103A-103B. Classical Persian Poetry. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A or 101B or consent of instructor. Systematic study of poems belonging to all genres of classical Persian poetry, with considerations of questions of prosody, rhetoric, and style.

104B. Contemporary Persian Literature. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 103A or 103B or consent of instructor. This course will deal with significant works of Persian prose and poetry from the beginning of the 19th century down to the present. Complete works or extracts from them will be read in the original as a preliminary to their analysis in terms of literary and stylistic development, as well as the changing role of literature in society.

A. The works of the 19th century and the period of the Constitutional Revolution (1905-1911).

B. The literature of the rest of the 20th century.

105. Modern Analytical Prose in Persian. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or consent of instructor. Advanced course deals with the theoretical, critical, historical, literary and aesthetic and philosophical, and various themes of literary and cultural criticism in Persian. It concentrates on selected modern analytical, discursive, and expository texts in Persian. The course explores from an inter- and multidisciplinary perspective how different movements, genres, and rhetorical aspects of modern/contemporary literature and culture are interrelated, historically contextualized, and critically positioned within the larger intellectual and scholarly domain in Persian. All texts will be read in the original Persian. (F,SP)

190. Special Topics in Persian. Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A or equivalent. Topics explore special themes and problems in Persian language and literature. They often reflect the research interests of the instructor and supplement regular curricular offerings. Specific descriptions of current offerings are available through the department. (F,SP)

H195. Senior Honors. (2-4) Must be taken on a passed/not passed basis. Prerequisites: Limited to senior honors candidates. Directed study centered upon preparation of an honors thesis.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations shown in this catalog.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations shown in this catalog.

Graduate Courses

200A-200B. Advanced Persian. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 12 units of upper division coursework in Persian or consent of instructor. Advanced topics in Persian literature from various periods of Persian culture and literary history.

202A-202B. Persian Sufi Writings. (3,3) Course may be repeated for credit. Three hours of lecture per week. Readings in all genres of Sufi expression, prose and poetry, with concentration on major figures.

203A-203B. Persian Historical Texts. (3,3) Course may be repeated for credit. Three hours of lecture per week. Systematic reading of the classical Persian historiography, from the 10th to the 18th centuries.

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Persian. Topics vary and are announced at the beginning of each semester.

Professional Courses

301A-301B. Teaching Persian in College. (3,3) Two hours of discussion per week plus occasional classroom demonstration as needed. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. Lectures on the methodology of teaching Persian as a foreign language at the college level. Lectures on constructive analysis of English and Persian, classroom strategies, and the development of instructional materials. Required of all new graduate student instructors in Persian. (F,SP)
Prerequisites: 100A-100B or equivalent.

190. Special Topics in Turkish. (3) Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Upper Division Courses: Five hours per week.

Graduate Courses:

205A-205B. Ugaritic. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Graduate Courses: Ugaritic language and literature with stress on comparative morphology and lexicography. Sequence begins in the fall.

209A-209B. Northwest Semitic Epigraphy. (4,4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 101A-101B or 100A-100B or equivalent. Graduate Courses: Reading knowledge of Biblical Hebrew. This two-course sequence will study the epigraphic remains of the Northwest Semitic languages. First semester will study inscriptions in Hebrew. Second semester topics will vary from year to year. Possible topics include Canaanite dialects; El-Amarna Akkadian; Eblaite. The inscriptions will be studied both from the perspective of the comparative history of the Northwest Semitic languages and also for their relevance in illuminating contemporaneous history and culture.

Turkish

Lower Division Courses

1A-1B. Elementary Modern Turkish. (5,5) Five hours of lecture per week. Sequence begins in the fall.

Upper Division Courses

100A-100B. Intermediate Modern Turkish. (5,5) Five hours of lecture per week. Prerequisites: 1A-1B or equivalent. Sequence begins in the fall.

101A-101B. Readings in Modern Turkish. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 100A-100B or equivalent. Special Topics in Turkish. Topics vary and are announced at the beginning of each semester.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Instruction in areas not covered by regularly scheduled courses.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Enrollment is restricted by regulations in this catalog.

Graduate Courses:

298. Seminar. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. Special topics in Turkish. Topics vary and are announced at the beginning of each semester.

Neuroscience

(Interdisciplinary Graduate Program)

Office: 3433 Tolman Hall, (510) 642-8915
neuroscience@berkeley.edu
Chair: John J. Ngai, Ph.D.

Professors:

Martin S. Banks, Ph.D. University of Minnesota (Optometry)
Mark D'Esposito, M.D. State University of New York Health Science Center at Syracuse, College of Medicine
Yang Dan, Ph.D. Columbia University (Molecular and Cell Biology)
John Flannery, Ph.D. University of California, Santa Barbara (Optometry)
Jack Gallant, Ph.D. Yale University (Psychology)
Gian Garriga, Ph.D. St. Louis University (Molecular and Cell Biology)
Ethel Isaacoff, Ph.D. McGill University (Molecular and Cell Biology)
Richard Ivey, Ph.D. University of Oregon (Psychology)
William Jaugust, M.D. State University of New York, Stony Brook (Optometry)
Andrew Wurmser, Ph.D. University of California, San Francisco (Psychology)
Walter J. Freeman, Ph.D. University of California, San Francisco (Psychology)

Associate Professors:

Daniela Kaufer, Ph.D. Hebrew University
Michael DeWeese, Ph.D. Princeton University
Jose Carmena, Ph.D. University of Edinburgh
Diana Bautista, Ph.D. Stanford University
Jonathan Wallis, Ph.D. Cambridge University
Matthew Walker, Ph.D. Medical Research Council, United Kingdom (Psychology)
Lance Kriegsfeld, Ph.D. The Johns Hopkins University (Psychology)

Assistant Professors:

Frédéric Theunissen, Ph.D. University of California, Berkeley (Psychology)
Yang Dan, Ph.D. Columbia University (Optometry)
Arthur P. Shimamura, Ph.D. University of Washington (Psychology)
Dennis M. Levi, Ph.D. University of Houston (Optometry)
John Ngai, Ph.D. California Institute of Technology (Molecular and Cell Biology)
Bruno Orsini, Ph.D. California Institute of Technology Mu-ming Poo, Ph.D. Johns Hopkins University (Molecular and Cell Biology)
David Schaffer, Ph.D. Massachusetts Institute of Technology (Chemical Engineering)
Mark A. Tandon, Ph.D. Yale University (Environmental Science, Policy, and Management)
Frederic Theunissen, Ph.D. University of California, Berkeley (Psychology)
Robert S. Zucker, Ph.D. Stanford University (Molecular and Cell Biology)

Associated Laboratories:

The Neuroscience Institute, approximately 50 faculty and laboratories, participate in neuroscience training and research. The program includes, in addition to faculty from the Helen Wills Neuroscience Institute, approximately 50 faculty members from the Departments of Molecular and Cell Biology; Psychology; Integrative Biology; Physics; Electrical Engineering and Computer Sciences; Chemical and Biomolecular Engineering; Environmental Science, Policy, and Management; Public Health; and Public Health. Faculty members participate in neuroscience graduate training and research from the molecular and genetic levels to the cognitive and computational levels. Areas of training and research include analysis of ion channels, receptors, and signal transduction mechanisms; formation, function, and plasticity of synapses; control of neural cell fate and pattern formation; neuronal growth cone guidance and target recognition; mechanisms of sensory processing in the visual, auditory, and olfactory systems; development and function of neural networks; computational theories of learning and modeling; motor control; and the neural basis of cognition. The preparations in use range from reductionist models to complex neural systems and include cells in culture, simple invertebrate and vertebrate organisms, model genetic systems, the primate cerebral cortex, and human brain imaging.

Faculty in the Neuroscience Graduate Program are involved in three broad research areas: cellular, molecular, and developmental neuroscience; systems and computational neuroscience; and cognition, brain, and behavior. Individual faculty may be involved in more than one research area.

Applicants to the program should have a bachelor's degree in science from a four-year college and at least one year of laboratory experience. Applicants may take courses in other specialized areas important to their research interests. Applicants are required to submit GRE General Test scores, and are strongly encouraged to submit one GRE Subject Test score (in biochemistry and cell biology, chemistry, psychology, biology, computer science, or physics).

During the first two years in the program, each student is required to take a minimum of three 3- or 4-unit graduate (200-level) courses chosen from a wide range of specialized graduate courses. Graduates advise students to tailor their coursework to their individual needs and interests. To ensure breadth in didactic coursework, however, students are required to choose courses that are distributed between at least two subdisciplines of neuroscience (i.e., cell, molecular, and developmental neuroscience; systems and computational neuroscience; and cognition, brain, and behavior). Note: Students, with approval from the graduate adviser, may take courses in other specialized areas important for developing their research foundation, such as biochemistry, genetics, statistics, physics, bioengineering, etc. Independent research in different laboratories starts at the beginning of the first year.

Students are also required to serve as graduate student instructors for at least two semesters during their first three years of study. Graduate students advance to candidacy for the Ph.D. by passing a qualifying examination at the end of the
New Media

(College of Letters and Science)

Program Office: Berkeley Center for New Media, 426 Sutardja Dai Hall #175B, (510) 642-4355

Director: David Bates, Ph.D.

Assistant Professors

Abigail De Kosnik, Ph.D. Northwestern University. Popular culture and digital culture
Kimiko Ryokai, Ph.D. Massachusetts Institute of Technology. Human-computer interaction, tangible user interfaces

Graduate Adviser: Dan O’Neill, Ph.D.

Overview

Berkeley Center for New Media (BCNM) is a focal point for research and teaching about new media, led by a highly transdisciplinary community of 120 affiliated faculty, advisers, and scholars, from 35 Berkeley departments, including Architecture, Philosophy, Film Studies, Art History, Performance Studies, and Music; the Schools of Engineering, Information, Journalism, and Law; and the Berkeley Art Museum. BCNM is located at a global center for design and information technology and based in a public research university known for alternative thinking.

Our mission is to critically analyze and help shape developments in new media from cross-disciplinary and global perspectives that emphasize humanities and the public interest.

All media (Latin for “middle elements”) facilitate transformation: by definition, media are transformative. From the stone tablet to the printing press to the Internet, media have become increasingly reconfigurable. The value of a medium is often related to its capacity for reconfiguration. To claim a medium as “new” is to posit a meaningful improvement over prior media. Thus, we have systematic and critical understanding of aesthetics, cultural, and political forces. As media transform, they often deeply rooted in powerful aesthetic, cultural, and political forces. As media transform, they often distort. Sophocles observed, “Nothing vast enters the life of mortals without a curse.” BCNM actively engages scholars who critically examine the opportunities and risks associated with new media and who consider how new media can constructively benefit education, political engagement, privacy, and aesthetic experience.

BCNM catalyzes research, educates future leaders, and facilitates public discourse through courses, lectures, symposia, and special events. BCNM has established cross-disciplinary faculty positions and a special program for Ph.D. students. BCNM supports academic modes of scholarship while encouraging unorthodox artworks, designs, and experiments. By reaching out to students, researchers, industry figures, and the broader public, BCNM stimulates new perspectives on contemporary new media.

Designated Emphasis in New Media

BCNM’s designated emphasis is for selected students from any Berkeley doctoral program. It provides enhanced skills in analyzing and designing future media with an awareness of historical, social, cultural, and other perspectives that might not be visible from any single disciplinary point of view. Students take two core courses—Theory and History of New Media and Art, Technology, Culture—while working across the disciplines to fulfill three breadth requirements in the fields of humanities, technology, and art/design. Students completing the Ph.D. program receive the designation “In New Media” on their diplomas.

Upper Division Courses

190. Special Topics in New Media. (1-4) Course may be repeated for credit as topic varies. One to four hours of lecture/seminar per week. See online Schedule of Classes for current offerings. Pre-requisites deal with new media and related issues. (F,SP) Staff

198. Directed Group Study. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of work per unit per week. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing. Course may be student-initiated or initiated by a faculty affiliate of the Center for New Media. The subject matter will vary from semester to semester. Seminars will be taught by a student facilitator under the supervision of the faculty sponsor, and students must be a faculty affiliate of the Berkeley Center for New Media. (F,SP) Staff

426. Theory and Practice of Tangible User Interfaces. (4) Students will receive no credit C262 after taking C290. Section 1. Three hours of lecture and one hour of laboratory per week. This course explores the theory and practice of Tangible User Interfaces, a new approach to human-computer interaction. The course covers topics in computer science and computer science and related areas. Students design and develop experimental Tangible User Interfaces using physical computing prototyping tools and write a final project report. Also listed as Information C262. (F,SP) Goldberg

C265. Interface Aesthetics. (2) Students will receive no credit for C265 after taking Information 290, Section 6 (spring 2009 or fall 2010; 290, Section 1 (spring 2009); or 290, Section 2 (fall 2010). Two hours of lecture per week. The course will cover new interface metaphors beyond desktops (e.g., for mobile devices, computationally enhanced environments, tangible user interfaces) but will also cover visual design basics (e.g., color, layout, typography, iconography) so that we have systematic and critical understanding of aesthetically engaging interfaces. Students will get a hands-on learning experience on these topics through course projects, design critiques, and discussions in addition to lectures and readings. Also listed as Information C265. (SP) Ryokai

290. Special Topics in New Media. (1-4) Course may be repeated for credit as topic varies. One to four hours of lecture/seminar per week. See online Schedule of Classes for current section offerings.
Nuclear Engineering
(College of Engineering)

Department Office: 4153 Etcheverry Hall, (510) 642-5010 www.nuc.berkeley.edu
Chair: Per F. Peterson, Ph.D.

Professors
Joohong Ahn, Ph.D. University of California, Berkeley.
Principles of reactor safety, reactor technology,
and nuclear systems.

Selig N. Kaplan (Emeritus), Ph.D.
John Verboncoeur, Ph.D.
Kai Vetter, Ph.D. (In Residence)
Numerical Methods in Particle Transport Theory and Reactor Physics
Upper Division Courses

Jasmina L. Vujic, Ph.D. University of Michigan. Numerical
Methods in Particle Transport Theory and Reactor Physics

Per F. Peterson (Chair), Ph.D. University of California, Berkeley.
Ph.D. in nuclear engineering.

Kai Vetter, Ph.D. (In Residence)

Note:

Staff

The B.S. program is accredited in nuclear engineering by the Accreditation Commission of
the ABET, Inc., 111 Market Place, Suite 1050, Boulder, CO 80302-4012; (410) 347-7700.

Curticulum and Requirements for the Bachelor's Degree

Students must complete a minimum of 120 units, in
which they must satisfy the University of California
and Berkeley campus requirements outlined in this
catalog. In addition, students must complete the
requirements for the College of Engineering and the
general nuclear engineering program. Full
details on these requirements are found in the
College of Engineering Announcement: A Guide to Undergraduate and Graduate Study.

Graduate Study

Admission to the graduate program in nuclear engineering is available to qualified individuals
who have obtained a bachelor's degree from a recognized institution in one of the fields of
engineering or the physical sciences. For all programs, required preparation in undergraduate coursework includes mathematics through partial differential equations and advanced analysis, nuclear reac-
tions, and thermodynamics. Admission is granted on the basis of undergraduate and graduate
records (if any), statement of purpose, record of work experience and professional activities, let-	ers of recommendation, and the GRE and TOEFL

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Preface
I. Introduction to Nuclear Engineering
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IV. Nuclear Reactor Physics
V. Nuclear Fuel Cycle
VI. Nuclear Waste Management
VII. Radiation Protection
VIII. Environmental Effects of Nuclear Energy
IX. Energy Systems, Health and Environmental Impacts of Nuclear Energy
X. Nuclear Engineering Education
XI. Future of Nuclear Engineering

See the College of Engineering Announcement: A Guide to Undergraduate and Graduate Study for more information.

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated
for credit as topic varies. One hour of seminar per week.
Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter
grade basis. The Freshman Seminar Program has been designed to provide new students with the oppor-
tunity to explore an intellectual topic with a faculty member in a small-class setting. Freshman
seminar topics and titles will vary from department to department and semester to semester. (F,SP)

92. Issues in Nuclear Science and Technology. (2)
Two hours of lecture per week. Formerly 39A. Intro-
duction to technical, social, institutional, and ethical
issues in nuclear engineering; nuclear reactors and
protection, environmental effects, nuclear safety,
Nuclear engineering is concerned with the appli-
cations of nuclear reactions and radiation to bio-
medical devices, energy systems, and environ-
mental concerns and issues. The scope of the field
includes the design, analysis, and operation of
nuclear reactors and their nuclear fuel cycles,
devices for the detection, prevention, and treat-
ment of disease, and systems for the treatment and
disposal of high-level radioactive waste. The
problems taught in the nuclear engineering courses
are applicable both to nuclear fission reactors and
to the development of nuclear fusion as an energy
source. The nuclear engineering courses deal with
the physical principles of nuclear reactions, the
interaction of nuclear radiation with matter, the
behavior of neutrons in reactor media, the ther-
mal and hydrodynamic principles of heat extraction,
the properties of nuclear materials, and operations
and processes in nuclear fuel cycles, reactor
design, and transmutation fusion. These subjects
are taught in courses at the undergraduate and
graduate levels. Other courses include radiation
protection, environmental effects, nuclear safety,
risk analysis, high-level radioactive waste dis-
posal, medical imaging, biophysics, and biomed-
ical devices.

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&H requirement
AC suffix/course satisfies American Cultures requirements
W prefix=online course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

Overview

Nuclear engineering is concerned with the appli-
cations of nuclear reactions and radiation to bio-
medical devices, energy systems, and environ-
mental concerns and issues. The scope of the field
includes the design, analysis, and operation of
nuclear reactors and their nuclear fuel cycles,
devices for the detection, prevention, and treat-
tment of disease, and systems for the treatment and
disposal of high-level radioactive waste. The
problems taught in the nuclear engineering courses
are applicable both to nuclear fission reactors and
to the development of nuclear fusion as an energy
source. The nuclear engineering courses deal with
the physical principles of nuclear reactions, the
interaction of nuclear radiation with matter, the
behavior of neutrons in reactor media, the ther-
mal and hydrodynamic principles of heat extraction,
the properties of nuclear materials, and operations
and processes in nuclear fuel cycles, reactor
design, and transmutation fusion. These subjects
are taught in courses at the undergraduate and
graduate levels. Other courses include radiation
protection, environmental effects, nuclear safety,
risk analysis, high-level radioactive waste dis-
posal, medical imaging, biophysics, and biomed-
ical devices.

299. Individual Study or Research. (1-4) Course
may be repeated for credit as topic varies. One
to four hours of independent study per week.
Individual study or research with Center for New
Media-affiliated faculty. This course provides the opportunity to
search out and study in detail subjects unavailable in
the ordinary course offerings. Unit credit will reflect
continuous attendance as regular courses, and will
include both meetings with faculty sponsor and inde-
pendent work. (F,SP)

Admission to the graduate program in nuclear engineering is available to qualified individuals
who have obtained a bachelor’s degree from a recognized institution in one of the fields of engi-
néering or the physical sciences. For all programs, required preparation in undergraduate coursework
includes mathematics through partial differential
equations and advanced analysis, nuclear reactions,
and thermodynamics. Admission is granted on the basis of undergraduate and graduate
records (if any), statement of purpose, record of work experience and professional activities, let-
ers of recommendation, and the GRE and TOEFL

101. Nuclear Reactions and Radiation. (4)
Four hours of lecture per week. Prerequisites: Physics 7C.
Energetics and kinetics of nuclear reactions and radiation; decay, fission, fusion, and interactions of
low-energy neutrons; properties of the fission produc-
tions and the actinides; nuclear models and transition probabilities; interaction of radiation with matter.

102. Nuclear Reactions and Radiation Laboratory. (3)
One hour of lecture, one hour of discussion, and
four hours of laboratory per week. Prerequisites: 101.
Laboratory course in nuclear physics. Experiments
will allow students to directly observe phenomena dis-
cussed in Nuclear Engineering 101. The experiments
will give students exposure to: (1) electronics,
(2) alpha, beta, gamma radiation detectors, (3)
radioactive sources, and (4) experimental methods
relevant to all aspects of nuclear science. Experi-
ments include Rutherford scattering, X-ray fluores-
cence, muon lifetime, gamma-gamma angular
correlations, Mössbauer effect, and radon measure-
ments. (F,SP, Vetter)

104. Radiation Detection and Nuclear Instrumenta-
laboratory: (4) Two hours of lecture and four
hours of laboratory per week. Prerequisites: 101 or
equivalent or consent of instructor; 150 or equivalent
recommended. Formerly 104A. Basic science of radi-
ation measurement, instrumentation, neutron,
neutrons, radiation dosimetry. The lectures emphasize
the principles of radiation detection. The weekly lab-
atory applies a variety of radiation detection sys-
tems to the practical measurements of interest for
nuclear power, nuclear and non-nuclear science,
and environmental applications. Students present
goals and approaches of the experiments being per-
formed. (SP, Vetter)

107. Introduction to Imaging. (3) Three hours
of lecture per week. Prerequisites: 101 and 104A or
consent of instructor. Introduction to medical imaging
physics and systems, including X-ray computed
tomography (CT), nuclear magnetic resonance (NMR),
radiation tomography (PET), and SPECT; basic
principles of tomography and an introduction to unfolding methods; resolution effects of counting
system resolution and human fac-
tors. (SP, Vetter)

120. Nuclear Materials. (4) Three hours of
lecture and one hour of discussion/demonstration per week.
Prerequisites: Engineering 45 and an upper division
course in thermodynamics. Effects of irradiation on
mechanical properties of materials in nuclear reactors. Fission product swelling and release;
neutron damage to structural alloys; fabrication and
properties of uranium dioxide fuel. (F, Virth)

124. Radioactive Waste Management. (3) Three
hours of lecture per week. Prerequisites: Engineering
117 or equivalent or consent of instructor. Components and
material flowsheets for nuclear fuel cycle, waste
characteristics, sources of radioactive wastes, com-

positions, radioactivity and heat generation; waste treatment technologies; waste disposal technologies; safety assessment of waste disposal. (F,SP) Ahn

130. Analytical Methods for Non-proliferation. (4) Three hours of lecture and one to three hours of laboratory per week. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Use of nuclear measurement techniques to detect clandestine movement and/or possession of nuclear materials. Nuclear detection basics, signatures, and active and passive interrogation methodologies will be explored. Techniques currently deployed for arms control and treaty verification will be discussed. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Formerly 161. A systems approach to the development of procedures for nuclear medicine and radiation therapy. Each semester a special topic will be chosen by the class as a whole. In addition to the technology, the design should address issues relating to economics, the environment, and risk assessment. (SP) Staff

170B. Nuclear Design: Design in Bionuclear Medicine, and Radiation Therapy. (3) Three hours of lecture per week. Prerequisites: 107, 161, or consent of instructor. Formerly 167. A systems approach to the development of procedures for nuclear medicine and radiation therapy. Each semester a special topic will be chosen by the class as a whole. In addition to the technology, the design should address issues relating to economics, the environment, and risk assessment. (SP) Staff

170F. Methods of Risk Analysis. (3) Four hours of lecture per week. Prerequisites: Upper division standing. Methodological approaches for the quantification of technological risk and risk based decision making. Probabilistic safety assessment, human health risks, environmental and ecological risk analysis. (SP) Kastensmidt

180. Introduction to Controlled Fusion. (4) Three hours of lecture and one hour of discussion/demonstration per week. Prerequisites: Physics 7C. Introduction to energy production by controlled thermonuclear fusion. One to four hours of laboratory per week. Formerly 33. Offered even-numbered years. (SP) Vetter

H194. Honors Undergraduate Research. (1-4) Course may be repeated for credit once. Course may be repeated for credit once for a maximum of independent study per year. Prerequisites: Upper division or graduate course in nuclear engineering. Offered during the fall and spring semesters. (SP) Ahn

210. Nuclear Power Engineering. (4) Three hours of lecture and one hour of discussion/demonstration per week. Prerequisites: Course(s) in fluid mechanics and thermodynamics, and nuclear engineering. Advanced nuclear reactor design, fuel cycle, reactivity control, reactor dynamics. Energy conversion in nuclear power systems; design of fission reactors. and structural thermal analysis. Nuclear power systems; safety evaluation and engineered safety systems. (F) Peterson

162. Radiation Biophysics and Dosimetry. (3) Three hours of lecture per week. Prerequisites: Upper division standing or consent of instructor. Interaction of radiation with matter: physical, chemical, and biological effects of radiation on human tissues; dosimetry units and measurements; internal and external radiation fields and dosimetry; radiation exposure regulations; sources of exposure to radiation; basic radiation shielding concepts; elements of radiation protection and control; theories and models for cell survival, radiation sensitivity, carcinogenesis, and dose calculation. (SP) Vucic

167. Nuclear Reactor Safety. (3) Three hours of lecture per week. Prerequisites: 150, 161, or consent of instructor. Principles and methods used in the safe evaluation of nuclear power plants. Safety philosophy, design criteria, and regulations. Deterministic and probabilistic methods. Safety analysis, nuclear and thermal-hydraulic transients, radiological consequences, and risk assessment. Design-basis and severe accident analysis, role of engineered safety systems, accident analysis. Formerly 150. Four hours of lecture per week. Prerequisites: 150, 161, or consent of instructor. Advanced concepts in the detection of ionizing radiation relevant for basic and applied sciences, nuclear non-proliferation, and homeland security. Theory and applications of the gamma and neutron fission products and detection concepts relevant for protection against ionizing radiation. Offered even-numbered years. (F,SP) Fetter

224. Safety Assessment for Geological Disposal of Radioactive Wastes. (3) Three hours of lecture per week. Prerequisites: 101, 167 recommended. Safety assessment of geological disposal of radioactive waste. Use of nuclear measurement techniques to detect clandestine movement and possession of nuclear materials by third parties. Nuclear detection, forensics, signatures, and active and passive interrogation methodologies will be explored. Techniques currently deployed for arms control and treaty verification will be discussed. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Formerly 124 and 150 are recommended. This course is intended for graduate students interested in acquiring a foundation in nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal. The emphasis is on the relationship between nuclear-power utilization and its environmental impacts. The goal is for graduate engineering students to gain sufficient understanding of nuclear-power utilization and its effects on the environment, so that they are better prepared to design an advanced system that would result in minimized environmental impact. The lectures will consist of two major parts. The first half includes mathematical models for individual processes in a fuel cycle, such as nuclear fuel reprocessing, waste solidification, repository performance, and nuclear transmutation in a nuclear reactor. In the second half, these individual models are integrated, which enables students to evaluate environmental impact of a fuel cycle. Offered alternate spring semesters. (SP) Ahn

230. Analytical Methods for Non-Proliferation. (4) Three hours of lecture per week. Prerequisites: 101, 150, or equivalent course in nuclear physics. Use of nuclear measurement techniques to detect clandestine movement and/or possession of nuclear materials by third parties. Nuclear detection, forensics, signatures, and active and passive interrogation methodologies will be explored. Techniques currently deployed for arms control and treaty verification will be discussed. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Formerly 124 and 150 are recommended. This course is intended for graduate students interested in acquiring a foundation in nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal. The emphasis is on the relationship between nuclear-power utilization and its environmental impacts. The goal is for graduate engineering students to gain sufficient understanding of nuclear-power utilization and its effects on the environment, so that they are better prepared to design an advanced system that would result in minimized environmental impact. The lectures will consist of two major parts. The first half includes mathematical models for individual processes in a fuel cycle, such as nuclear fuel reprocessing, waste solidification, repository performance, and nuclear transmutation in a nuclear reactor. In the second half, these individual models are integrated, which enables students to evaluate environmental impact of a fuel cycle. Offered alternate spring semesters. (SP) Ahn

220. Irradiation Effects in Nuclear Materials. (3) Three hours of lecture per week. Prerequisites: 120 or consent of instructor. Physical aspects and computer simulation of radiation damage, displacement damage and irradiation creep. Mechanical analysis of structures under irradiation. Spattering, blistering, and hydrogen behavior in fission reactor materials. Offered odd-numbered years. (SP) Wirth

221. Corrosion in Nuclear Power Systems. (3) Three hours of lecture per week. Prerequisites: 101, 167 recommended. Corrosion in nuclear reactors. (SP) Kastenmidt

222. Safety Assessment for Geological Disposal of Radioactive Wastes. (3) Three hours of lecture per week. Prerequisites: 101, 150, or equivalent course in nuclear physics. Use of nuclear measurement techniques to detect clandestine movement and possession of nuclear materials by third parties. Nuclear detection, forensics, signatures, and active and passive interrogation methodologies will be explored. Techniques currently deployed for arms control and treaty verification will be discussed. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Formerly 124 and 150 are recommended. This course is intended for graduate students interested in acquiring a foundation in nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal. The emphasis is on the relationship between nuclear-power utilization and its environmental impacts. The goal is for graduate engineering students to gain sufficient understanding of nuclear-power utilization and its effects on the environment, so that they are better prepared to design an advanced system that would result in minimized environmental impact. The lectures will consist of two major parts. The first half includes mathematical models for individual processes in a fuel cycle, such as nuclear fuel reprocessing, waste solidification, repository performance, and nuclear transmutation in a nuclear reactor. In the second half, these individual models are integrated, which enables students to evaluate environmental impact of a fuel cycle. Offered alternate spring semesters. (SP) Ahn

223. The Nuclear Fuel Cycle. (3) Three hours of lecture per week. Prerequisites: 120, 150, or equivalent course in nuclear physics. Use of nuclear measurement techniques to detect clandestine movement and possession of nuclear materials by third parties. Nuclear detection, forensics, signatures, and active and passive interrogation methodologies will be explored. Techniques currently deployed for arms control and treaty verification will be discussed. Prerequisites: 101 or equivalent course in nuclear physics, or consent of instructor. Formerly 124 and 150 are recommended. This course is intended for graduate students interested in acquiring a foundation in nuclear fuel cycle with topics ranging from nuclear-fuel reprocessing to waste treatment and final disposal. The emphasis is on the relationship between nuclear-power utilization and its environmental impacts. The goal is for graduate engineering students to gain sufficient understanding of nuclear-power utilization and its effects on the environment, so that they are better prepared to design an advanced system that would result in minimized environmental impact. The lectures will consist of two major parts. The first half includes mathematical models for individual processes in a fuel cycle, such as nuclear fuel reprocessing, waste solidification, repository performance, and nuclear transmutation in a nuclear reactor. In the second half, these individual models are integrated, which enables students to evaluate environmental impact of a fuel cycle. Offered alternate spring semesters. (SP) Ahn

250. Nuclear Reactor Theory. (4) Four hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. Fission characteristics; neutron chain reactions, neutron transport and diffusion theory; reactor kinetics; multigroup neutron transport; thermal spectrum calculations, inhomogeneous reactor design, effects of poisons and fuel depletion. Offered odd-numbered years. (F) Greenspan

255. Numerical Simulation in Radiation Transport. (3) Three hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. Fission characteristics; neutron chain reactions, neutron transport and diffusion theory; reactor kinetics; multigroup neutron transport; thermal spectrum calculations, inhomogeneous reactor design, effects of poisons and fuel depletion. Offered odd-numbered years. (F) Greenspan

202. Radiation Biophysics and Dosimetry. (3) Three hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. The use of radiation in medicine and medical imaging, applications of medical physics, X-ray imaging, CT, MRI, and PET. (F,SP) Vetter

203. Radiation Detection, Forensics, Signatures, and Active and Passive Interrogation Concepts. (3) Three hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. The use of radiation in medicine and medical imaging, applications of medical physics, X-ray imaging, CT, MRI, and PET. (F,SP) Vetter

204. Advanced Concepts in Radiation Detection and Measurements. (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: 101, 150; or equivalent course in nuclear physics. Advanced concepts in the detection of ionizing radiation relevant for basic and applied sciences, nuclear non-proliferation, and homeland security. Theory and applications of the gamma and neutron fission products and detection concepts relevant for protection against ionizing radiation. Offered even-numbered years. (F,SP) Fetter

205. Nuclear Reactor Theory. (4) Four hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. Fission characteristics; neutron chain reactions, neutron transport and diffusion theory; reactor kinetics; multigroup neutron transport; thermal spectrum calculations, inhomogeneous reactor design, effects of poisons and fuel depletion. Offered odd-numbered years. (F) Greenspan

206. Nuclear Reactor Safety. (3) Three hours of lecture per week. Prerequisites: 101, 150; Engineering 117 recommended. Fission characteristics; neutron chain reactions, neutron transport and diffusion theory; reactor kinetics; multigroup neutron transport; thermal spectrum calculations, inhomogeneous reactor design, effects of poisons and fuel depletion. Offered odd-numbered years. (F) Greenspan
Nutritional Science and Toxicology

Department Office: 117 Morgan Hall, (510) 642-6490
Chair: Joseph L. Napoli, Ph.D.

Gregory W. Aponte, Ph.D. University of California, Davis. Gastrointestinal peptides and nutrient assimilation
Linden F. Beidlines, Ph.D. University of California, Los Angeles. Food toxicity, chemical carcinogenesis
John E. Casada, Ph.D. University of Wisconsin, Madison. Insecticide chemistry and toxicology
Benito O. Lumen, Ph.D. University of California, Davis. Cancer and diet

Department Overview

The research and curriculum of the Department of Nutritional Science and Toxicology addresses the fundamental biology of nutrients, phytochemicals, and diet-borne toxicants, using the techniques of modern biology and chemical analyses to understand the relationship among diet, the metabolic genome, and optimal health and disease risk. Our goals are to determine the molecular mechanisms of dietary effects on health, and the contribution of individual genotype to dietary responses and disease risk. This approach of metabolic biology will provide detailed insight into the impact of diet on human health and chronic disease risk. We seek to translate lab and model systems data to human physiology, thereby providing outreach through cooperative extension.

Nutritional Science and Toxicology (College of Natural Resources)
Undergraduate Programs

The Department of Nutritional Science and Toxicology offers two undergraduate majors—nutritional science and toxicology—leading to the B.S. degree. Courses that fulfill the lower division prerequisites for junior standing include Biochemistry 1A; Chemistry 1A, 3A/3AL-B6/3BL; English 1A-1B or English 1A-1B or English 16A-16B or English 22A or English 22B or English 35A or English 35B or English 35M or English 35N; Molecular and Cell Biology 32, 32L; Nutritional Science 10; Physics 8A; and Statistics 2.

Nutritional Science Major

The nutritional science major combines a strong foundation in the biological and chemical sciences with a choice of one of two areas of specialization: (1) physiology and metabolism focuses on the biochemical and physiological study of nutrient use as well as the study of food properties and processing of food materials; and (2) dietetics prepares students for careers as registered dietitians (RDs). RDs translate the science of nutrition into practical applications for individuals and groups in clinical, food service, or community settings. Graduates of this program must complete a dietetic internship and pass a national examination to become an RD.

Molecular Toxicology Major

The molecular toxicology major combines a strong foundation in the biological and chemical sciences with a focus on the hazardous and beneficial effects of natural and man-made toxic agents. From industrially produced environmental contaminants and designer drugs to naturally occurring herbs and plant medicines, the science of toxicology addresses the safety and activity of toxic agents in modern society. (F,SP)

Minors

Students who have pursued basic coursework in biological sciences under other majors may be eligible for one of the two undergraduate minors offered by the Department of Nutritional Science and Toxicology. Both minors require a minimum GPA of 2.5 and the completion of 15 units. The minor in nutritional science requires Nutritional Science 10, 103, 160, and five additional NST upper division units. The minor in toxicology requires Nutritional Science 110, C114, 120, 121, and one additional NST upper division course. All courses must be taken on the Berkeley campus for a letter grade. No course substitutions are allowed. Completion of the minor will only be noted on the Berkeley diploma. Students who have completed the requirements for the minor should apply for departmental certification during the semester they intend to graduate.

Honors Programs

Students who are interested in the Honors Program in nutritional science or molecular toxicology should apply during their junior or senior year. The Honors Program is individual research, NST 198E, for two semesters under the supervision of a faculty member. The supervised independent honors research is specific to aspects of the nutritional science and toxicology major, followed by an oral presentation, and written report. Acceptance in the CNR Honors Program is required through an application process. Contact the CNR Office of Instruction and Student Affairs in 260 Mulford Hall.

Graduate Programs

The department administers three Ph.D. graduate programs: (1) Ph.D. in molecular and biochemical nutrition, and (2) Ph.D. in molecular toxicology, and (3) M.S. in molecular and biochemical nutrition. The Molecular and Biochemical Nutrition Program provides interdisciplinary training in the theory and techniques of molecular and biochemical metabolic studies of nutrients and phytocannabis in humans, and in mammals that serve as models for humans. Molecular Toxicology Program focuses on the adverse effects of chemicals on living organisms and how these biomarkers are modulated by genetic, physiologic, and environmental factors. For more information, see the catalog section for each program.

Additional Information

Contact either the undergraduate student affairs adviser in 260 Mulford Hall, (510) 642-2879, or the graduate student adviser in 129 Morgan Hall, (510) 643-2863.

Lower Division Courses

10. Introduction to Human Nutrition. (3) Students will receive no credit for 10 after taking 103 or 160. Two hours of lecture and one hour of discussion per week. Formerly NUTR 10. This course provides an overview of digestion and metabolism of nutrients. Foods are discussed as a source of nutrients, and the evidence is reviewed as to the effects of nutrition on health. Students are required to record their own diet, calculate its composition, and evaluate its nutrient content in light of their particular needs. (F,SP) Staff

11. Introduction to Toxicology. (3) Two hours of lecture and one hour of discussion per week. Prereq-uisites: Open to students pursuing science and non science majors. Discussion of principles for the evaluation of toxic hazards of natural and man-made substances present in the environment, the workplace, food, drink, and drugs. The bases for species selectivity, individual variations in sensitivity and resistance, and the combined effects of toxic agents will be addressed. Issues related to the impact of toxic agents in modern society will be emphasized. (SP) Bajelanes, Casida, Smith

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Formerly Nutritional Sciences 24. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Chang

98. Directed Group Study. (1-3) Course may be repeated for credit. One hour of group study per week. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing and consent of instructor. Formerly Nutritional Sciences 98. Study of special topics in nutritional science that are not covered in depth in regular courses. (F,SP)

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Three hours of independent study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Nutritional Sciences 99. Lower division laboratory and independent research under the direction of a faculty supervisor. Written report required upon completion of the project. Enrollment is restricted by regulations in this catalog. (F,SP) Staff

Upper Division Courses

103. Nutrient Function and Metabolism. (3) Three hours of lecture per week. Prerequisites: 10, Molecular and Cell Biology 32, and Molecular and Cell Biology 102 (may be taken concurrently), or consent of instructor. Formerly Nutritional Sciences 103. Delivery of nutrients from foods to mammalian cells; major metabolic pathways; function of nutrients in energy metabolism, nitrogen and lipid metabolism, structural tissues and regulation; essentiality, activation, storage, excretion, and toxicity of nutrients. (F,SP)

104. Human Food Practices. (2) Two hours of lecture and one hour of discussion per week. Prerequisites: 10 recommended. Formerly Nutritional Sciences 104. Historical and modern trends in food choice; socio-economic, political and personal determinants of human diets. Community food and nutrition problems and programs. Food safety and consumer protection. Community nutrition education. (SP) M. Smith

108A. Introduction and Application of Food Science. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 102 (may be taken concurrently), or consent of instructor. Formerly Nutritional Sciences 108A. Introduction to the food science major, followed by the chemical, physical, functional, and nutritional properties of foods. Emphasis on how these properties, and preparation, processing, and storage, influence quality characteristics of food products. (F,SP) M. Smith

108B. Application of Food Science Laboratory. (1) Three hours of laboratory per week. Prerequisites: 108A or concurrent enrollment. Experimental evaluation of the chemical, physical, functional, and nutritional properties of foods, and the changes occurring during preparation that affect quality characteristics of food products. (F,SP) M. Smith

110. Toxicology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Molecular and Cell Biology 102 (may be taken concurrently), or consent of instructor. Formerly Nutritional Sciences 110. Introduction to the fundamentals of modern toxicology and their applications in evaluating the safety of foods, additives and environmental contaminants. Mechanisms of metabolic activation, detoxification, gene regulation, and selective toxicity are emphasized. (F,SP) Wang

C114. Pesticide Chemistry and Toxicology. (3) Three hours of lecture per week. Prerequisites: Introductory courses in organic chemistry and biology, or consent of instructor. Chemical composition of pesticides, related compounds and metabolites, resistance mechanisms, and methods of evaluating their safety and activity. Also listed as Environ Sci, Policy, and Management C148. (SP) Casida

115. Principles of Drug Action. (2) Two hours of lecture per week. Prerequisites: 110, 120 (may be taken concurrently), and Molecular and Cell Biology 102. Basic principles and quantitative aspects of drug action and risk/benefit as applied to the discovery, design and development of therapeutics. The course will highlight the importance of integrating pharmacology, toxicology, and pharmacokinetics to create effective and safe treatments for human disease. Special emphasis will be placed on pharmacogenomics and variation in individual response. (SP) M. Smith

C119. Advanced Toxicology. (3,4) Three to four hours of lecture per week. The application of toxicology to answer questions about safety and risk. Using a case-study approach, participants will learn how to interpret toxicological data and apply their knowledge to evaluating the risks presented by exposures to toxic chemicals, including drugs and environmental contaminants. Discussion of current topics of controversy in the field of toxicology. Also listed as Public Health C170B. (SP) M. Smith

120. Molecular Toxicology. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 110 or consent of instructor. Formerly Nutritional Sciences 120. Molecular toxicity attempts to understand the mechanisms by which compounds cause their toxic effects. The course will focus on our understanding of the important tissue and cellular components involved in chemical exposure from the point of entry to effect. Topics include metabolism and mechanisms of toxicants, toxicogenomics, toxicant effects in individuals and groups, and tools to predict toxicity. (SP) Vulpe

121. Computational Toxicology. (3) Three hours of lecture per week. Prerequisites: 110, 120 (may be taken concurrently). Formerly Nutritional Sciences 121. Introducing the use of bioinformatics tools useful in linking the molecular structure of chemicals to the toxicological effects in individuals and groups.
totoxicity they induce in biological systems. Discus-
sions on the highly interactive process of collecting, organ-
izing, and assimilating chemistry and toxicology information—and the use of computer programs to visualize, browse, and interpret this information to dis-
cover chemical structure-toxicity correlations. The
importance of these concepts in drug discovery and
defined risk and food safety will be emphasized. (SP, Johnson)

135. Food Systems Organization and Management. (4) Three hours of lecture and three hours of field-
work per week. Prerequisites: Consent of instructor. Formerly Nutritional Sciences 135. Principles of organ-
ization and applied to institutional food service systems: production and delivery systems, man-
agement of resources, quality assurance, equip-
ment, layout, marketing, personnel management, fiscal management. Laboratory experiences and fieldwork in institutional situations. (SP, Staff)

150. Mechanisms of Metabolic Regulation. (3) Three hours of lecture per week. Prerequisites: 103, or
Molecular and Cell Biology 102 or equivalent. Formerly Nutritional Sciences 150. Principles of metabolic regulation in higher animals. Integration of metabolic pathways and fluxes emphasizing experimental data and understanding mechanisms of nutrient affects. Advances in methods for studying metabolism, rang-
ing from isotopic to molecular genetics techniques. (SP, Staff)

160. Human Nutrition: Normal Physiology and Pathophysiology of Disease. (4) Three hours of lec-
ture and one hour of discussion per week. Prerequisites: 103, or Molecular and Cell Biology 102 or
equivalent. Formerly Nutritional Sciences 160. The normal human nutrient metabolism and the pathophysiological basis of common nutritional diseases will be discussed. Focus will be on metabolic integration in the whole organism. Conditions covered will include obesity, starvation, anorexia nervosa, dia-
betes, hypoglycemia, hyperglycemia, obesity, kidney failure, osteoporosis, fatigue, infectious disease, aging, and six hours of laboratory per week. Prerequisites: 103, and a course in statistics. Formerly Nutritional Sciences 161. Theory and concepts from 161A are applied through a variety of methods including completion of disease specific case studies, nutrition assessment from both human and animal nutrition, and medical record docu-
mentation. Students design and calculate therapeutic diets, and enteral supplements and parenteral nutrition support. Product analysis and supermarket surveys and nutrition labeling. (SP, Staff)

166. Nutrition in the Community. (3) Three hours of lecture per week. Prerequisites: 10 recommended; upper division standing required. Formerly Nutritional

Sciences 166. This course addresses basic nutrition in the context of the community. It explores nutrition pro-
grams that serve various segments of the population and the relationship of nutrition policy at the local, national, and international levels. Community assessment is used as the basis for pro-
gram planning, implementation, and evaluation. The topics include: food for infants, children nutrition (infants, children, and women, and the elderly) and ques-
tions of food security are investigated. (F, Staff)

170. Experimental Nutrition Laboratory. (4) Stu-
dents will receive no credit for 170 after taking 171.
Two hours of lecture and six hours of labora-
tory per week. Prerequisites: 103, or Molecular and
Cell Biology 104 or 142. (May be taken concurrently) or Integrative Biology 141. Formerly Nutritional Sciences 170. Basic principles and techniques used in human and animal nutrition research. Students design, execute, and analyze experiments. (SP, Staff)

171. Nutrition and Toxicology Laboratory. (4) Stu-
dents will receive no credit for 171 after taking 170. One hour of lecture, one hour of discussion, and six hours of laboratory per week. Prerequisites: 110, Molecular and Cell Biology 104 or 142; may be taken concurrently. Formerly Nutritional Sciences 171. Basic principles and techniques used in human and animal nutrition and toxicology research. Students design, execute, and analyze experiments. (SP, Staff)

190. Introduction to Research in Nutrition. (1) One hour of lecture/discussion per week. Prerequisites: 103, Formerly Nutritional Sciences 190. Students will attend an oral and written report on a topic selected from the current research lit-
erature in nutritional science. (F, SP, Staff)

192. Junior Seminar in Dietetics. (1) One hour of
lecture/discussion per week. Prerequisites: Upper divi-
sion standing and consent of instructor. Formerly Nutri-
tional Sciences 192. This course will focus on our understanding of the important

research approaches in areas of nutritional science. (F, SP, Staff)

210. Dietary Determinants of Cancer, Heart Dis-
ease, and Aging. (3) Three hours of lecture per week.
The influence of diet on DNA damage, cancer, and aging will be discussed with an emphasis on micro-
nutrient deficiencies as a major contributor to DNA damage, cancer, and aging. The high risk of diet on atherosclerotic heart disease will be covered with an emphasis on the role of dietary constituents proposed to have either toxic or preventive effects in the artery wall and to the overall health of the literature. Also listed as Molecular and Cell Biology C209. (SP, Staff)

211A-211B. Introduction to Research in Nutritional
Science. (4-8;4-8) One hour of discussion and four
hours of laboratory per week. Formerly Nutritional
Sciences 211A-211B. Closely supervised experimental work under the direction of individual faculty members; an introduction to experimental methods and research approaches in areas of nutritional science. (F, SP, Staff)

219. Advanced Toxicology. (3,4) Three to four hours of lecture per week. Prerequisites: 103. Formerly Nutritional Sciences 219. Course will focus on the area of genomics as it is expected to affect prac-
tice, to evaluating the risk presented by exposures to toxic compounds, including drugs and environmental con-
taminants. Discussion of current topics of controversy in the field of toxicology. Also listed as Public Health C270B. (SP, Smith)

220. Molecular Toxicology. (4) Three hours of lecture
and one hour of discussion per week. Prerequisites: 110 or consent of instructor. Molecular toxicology
attempts to understand the mechanisms by which hazardous compounds cause their toxic effects. The course will focus on our understanding of important tissues and cellular components involved in chemical exposure from entry to exit. Topics include metabolism and mechanisms of toxins, toxicoge-
nics and gene expression, xenobiotic detoxification, and methods to predict toxicity. (SP, Vulpe)

250. Mechanisms of Metabolic Regulation. (4) Three
hours of lecture and one hour of discussion per week.
Prerequisites: 103, or Molecular and Cell Biol-
ogy 102 or equivalent. Formerly Nutritional Sciences 250. Closely supervised experimental
work in the field of dietetics. Students will begin to develop his or her professional portfolio. (F, SP, Staff)

Nutritional Science and Toxicology / 407

B prefix=language course for business majors C prefix=course satisfies R&C requirement H prefix=honors course
290. Advanced Seminars in Nutritional Science. (1-2) Course may be repeated for credit. One to two hours of lecture/discussion per week. Prerequisites: Graduate standing. Formerly Nutritional Sciences 290. Advanced study of topics in nutritional sciences. More than one section may be taken simultaneously. (F,SP) Staff

292. Graduate Research Colloquium. (1) Course may be repeated for credit. One hour of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing. Formerly Nutritional Sciences 292. Presentations by graduate students of research proposals and results of their research. Participation in discussion and evaluation of others’ presentations is required. (F,SP) Staff

293. Research Seminar. (1) One hour of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Formerly Nutritional Sciences 293. Presentation and discussion of current faculty research projects and experimental techniques in nutritional science. Intended primarily for first year graduate students. (F) Staff

296. Research Review in Nutritional Science and Toxicology. Course may be repeated for credit. One to two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Review of current literature and discussion of original research. (F,SP) Staff

298. Directed Group Studies. (1-4) Course may be repeated for credit. One hour of lecture/discussion per week per unit. Prerequisites: Graduate standing and consent of instructor. Formerly Nutritional Sciences 298. Special study in various fields of nutritional science. Topics will vary depending on interests of qualified graduate students and availability of staff. (F,SP) Staff

299. Nutritional Science and Toxicology Research. (1-12) Course may be repeated for credit. Approximately four hours of research per week per unit. Prerequisites: Graduate standing and consent of instructor. (F,SP) Staff

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Approximately four hours of study per week per unit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. Formerly Nutritional Sciences and Toxicology 602. Individual study in consultation with the major field adviser intended to provide an opportunity for qualified students to prepare themselves for the various examinations required for candidates for the Ph.D. (F,SP) Staff

Professional Courses

301. Professional Preparation: Teaching in Nutritional Science. (1-2) One hour of lecture/discussion per week per unit. Prerequisites: Consent of instructor. Formerly Nutritional Sciences 301. Creative approaches to teaching nutrition to diverse audiences are emphasized. Participants will identify needs of target populations, formulate educational objectives, design and/or use motivational teaching strategies, and evaluate the impact of their teaching on knowledge, attitudes, and behavior. Undergraduates may teach nutrition to elementary school children. Graduates may become teaching assistants. (F) Bjeldanes, Ikeda

302. Professional Preparation: Supervised Teaching Experience in Nutrition. (1-4) Course may be repeated for credit. Three hours of supervised teaching experience per week per unit. Prerequisites: 301 (may be taken concurrently) and consent of instructor. Formerly Nutritional Sciences 302. Practical supervised experience in teaching nutrition and food science at the university level; planning, presentation, and evaluation of instructional units. (F-SP) Bjeldanes

Operations Research and Management Science

Operations Research and Management Science (ORMS) is a capped major in the College of Letters and Science administered by the Department of Industrial Engineering and Operations Research (IEOR). In the ORMS major, students develop solid quantitative, model building, and problem solving skills through core courses in mathematics, statistics, and operations research. This course provides students with the skills and tools they need to apply these skills in solving problems in an area of their choice. Students may design their own concentrations according to their interests, with guidance from their faculty adviser. The four possible areas of concentration are:

1. Decision Making in Economic Systems;
2. Decision Making in Industrial and Service Systems;
3. Decision Making in Societal Systems; and

Declaring the ORMS Major

The following courses must be completed to declare the ORMS major: Economics 1 or 2 or 3; Math 53 and 54; and Business Administration 10. After successful completion of the courses required to declare with minimum Berkeley GPA of 3.20, as well as 3.0 overall Berkeley GPA, you can be considered for admission to the Letters and Science ORMS major. Declaration limits of 25 students are in place for this major.

ORMS in Letters and Science vs. IEOR in the College of Engineering

An essential difference between the two majors is that Industrial Engineering and Operations Research program in the College of Engineering requires a greater number of physics, chemistry, and engineering courses than the ORMS program, which is more flexible and focuses on development of an area of interest/applications. In ORMS, students need to select a focus area of application before their senior year.

The ORMS major confers the Bachelor of Arts degree, while the IEOR major confers a Bachelor of Science.

ORMS Curriculum

Lower Division Requirements:
- Math 1A—Calculus (4 units)
- Math 1B—Calculus (4 units)
- Math 53—Multivariable Calculus (4 units)
- Math 54—Linear Algebra and Differential Equations (4 units)
- Engineering 7—Introduction to Computer Programming (4 units)
- Economics 1, 2, or 3—Introduction to Economics (4 units)
- Business Administration 10—Principles of Business (3 units)

Upper Division Requirements:
- Statistics 134—Concepts of Probability (3 units) or IEOR 172: Probability and Risk Analysis (3 units)
- Economics 101A—Economic Theory Micro (4 units)
- IEOR 131—Stimulation (3 units)
- IEOR 160—Operations Research I (3 units)
- IEOR 161—Operations Research II (3 units)
- Four clustered electives: see below (12 units)

A Concentration of Four Clustered Electives:

With prior approval from a faculty adviser, students select a minimum of four upper division elective courses to form a coherent cluster, or concentration, in an area where operations research is applied. Courses in other departments may count toward this requirement if they have substantial relevant content at an appropriately advanced level. Suggested clustered elective choices as well as additional information on the ORMS major and requirements can be found at ieor.berkeley.edu/AcademicPrograms/Ugrad/index.htm.

Honors Program

Students enter the Honors Program by application. Applications are available in the Advising office, 4145 Etcheverry Hall. If admitted, students must satisfy the requirements listed below. An official notation of the honors degree is made on their final Berkeley transcripts.

Before applying to the program, students must have at least 3.5 GPA overall and 3.7 GPA in the major. To graduate with honors, students must:
- find a faculty sponsor appropriate for an original research project that he or she wishes to do and enroll in two semesters (6 units) of the honors thesis course (H196A-196B). Alternatively, a student may take two approved graduate courses in operations research or a related field, and achieve at least an A- in each course.
- maintain a minimum 3.5 GPA overall and 3.7 in the major.
Optometry Programs

The School of Optometry provides professional training in the art and science of vision care. Drawing upon the principles of anatomy, optics, physiology, and psychology, the four-year professional program leads to the degree of Doctor of Optometry, which qualifies one to take national and state board examinations.

Doctors of Optometry are health care professionals. Optometry is a primary health care profession that encompasses the prevention and remediation of disorders of the vision system through examination, diagnosis, treatment, and/or management of visual efficiency, eye health, and related systemic manifestations. Optometry graduates are able to diagnose patients with ocular disease or systemic diseases with ocular manifestations. Recent graduates in optometry laws across the United States have expanded the scope of optometric practice, giving practitioners responsibility for nonsurgical pharmaceutical treatment of eye disorders and diseases.

Doctors of Optometry are educated in the sciences of anatomy, chemistry, physics, mathematics, neurology, bacteriology, microbiology, disease processes and detection, pharmacology, behavioral science, public health, and many other related fields. The school provides four years of comprehensive training in vision care aimed at training primary care practitioners. The first year emphasizes a broad study of sciences which form the background of optometry, such as ocular anatomy, medical physiology and biochemistry, ocular pathology, microbiology, virology, neuroanatomy, the psychology of vision, vision science, geometric optics, ophthalmic physics, pharmacology, and theoretical and practical optics. The second and third years are devoted to the science of optometry and the acquisition of skills in examination procedures. Although clinic participation is involved in all four years, active responsibility for patient care begins in the spring preceding the third year. The fourth year is devoted to primary care practice of optometry and the detailed study of specialized areas, including contact lenses, binocular and infant vision, vision functions, ocular disease, vision of the elderly, and low vision.

Optometry offers a wide variety of interesting, challenging, and rewarding careers in private practice, in hospitals and other health organizations, and in public service. The education acquired at the School of Optometry provides today’s Doctors of Optometry with the knowledge and skill necessary to meet the challenges of providing vision care.

For further information about the School of Optometry, visit our website at optometry.berkeley.edu.

Optometric Residency Program

A one year Optometric Residency Program is available to Doctors of Optometry seeking advanced optometric training. Areas of clinical study include binocular vision, cornea and contact lenses, low vision, ocular disease, pediatrics, and primary care.

Successful completion of the program leads to the awarding of the Optometric Residency Certificate. For further information about the Optometric Residency Program, visit the program website at optometry.berkeley.edu/grad/residency.html; or contact the Director of Residency Programs at the Tang Eye Center, 2222 Bancroft Way, Berkeley, CA 94720-2020; cwilmer@berkeley.edu.
The Graduate Program in Vision Science leads to the M.S. and Ph.D. degrees. The program is administered by the Group in Vision Science, representing cross-disciplinary faculty from the School of Optometry and the Departments of Psychology, Computer Science, Molecular and Cell Biology, Neuroscience, and Bioengineering, among others. The faculty is distinguished in their accomplishments and diverse in their areas of expertise. Research facilities available to graduate students in vision science are among the best in the world.

The Graduate Program in Vision Science provides training in a wide variety of topics pertaining to vision. These include the optics of the eye; molecular and cell biology of the eye; anatomy and neurophysiology of the retina and visual pathways; computational vision; clinical aspects of vision; and more. The graduate program is designed to prepare students for academic careers in research and teaching in vision science, optometry, ophthalmology, bioengineering, psychology, biology, and other related disciplines. It also prepares students for research careers in industrial settings in related areas.

Admission to this program requires a bachelor’s degree in a relevant discipline (such as biology, computer science, engineering, or psychology) or a doctoral degree in medicine or optometry.

For further details about the requirements for the Vision Science Graduate Program, visit vision.berkeley.edu. To contact our Admissions Office, email vision@berkeley.edu or write Graduate Student Affairs Officer, Group in Vision Science, University of California, Berkeley, 524 Main Hall #2020, Berkeley, CA 94720-2920.

Optometry

Lower Division Courses

10. The Eye and Vision in a Changing Environment. (2) Two hours of lecture per week. Course covers introduction to the basis of common sight-reducing visual disorders with major public health implications for society—e.g., myopia, cataracts, diabetic hypertensive eye disorders, developmental disorders (e.g., lazy eye), and environmentally induced disease and disorders (solar eye burns, cataract).

Major approaches to the prevention, diagnosis, and treatment of common disorders will be addressed in terms of the biological and optical sciences underlying the treatment or prevention. Impact of eye care on society and health care delivery will be reviewed. (SP Adams)

C10. The Eye and Vision in a Changing Environment. (2) Two hours of lecture per week. Course covers introduction to the basis of common sight-reducing visual disorders with major public health implications for society—e.g., myopia, cataracts, diabetic hypertensive eye disorders, developmental disorders (e.g., lazy eye), and environmentally induced disease and disorders (solar eye burns, cataract).

Major approaches to the prevention, diagnosis, and treatment of common disorders will be addressed in terms of the biological and optical sciences underlying the treatment or prevention. Impact of eye care on society and health care delivery will be reviewed. Also listed as Undergrad Interdisciplinary Studies C10. (SP Adams)

39. Freshman/Sophomore Seminar. Course may be repeated for credit. Section 1 and 2 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to discuss a topical topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. No prerequisites. Enrollment limits are set by the faculty, but the suggested limit is 25. (F,SP) Staff

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topics vary. One hour of seminar per week for 15 weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor.

Sophomore seminars offer opportunity for close, regular intellectual contact between faculty and students in the classroom. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP) Staff

98. Directed Group Study. (1) Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One hour of directed group study per week. Must be taken on a passed/not passed basis. Directed group study for undergraduates interested in the field of optometry. (F,SP) Van Suyters

Upper Division Courses

198. Directed Group Studies. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Directed group study for undergraduates interested in the field of optometry. (F,SP) Staff

Graduate Courses

200A. Clinical Examination of the Visual System. (4) Two hours of lecture and four hours of laboratory per week. Formerly 100A. Fundamentals of the optometric examination. Case history, visual acuities, objective and subjective methods of determining refractive states. Basic examination of anterior ocular structures and the ocular fundus; perimetry. (F)

200B. Clinical Examination of the Visual System. (4) Two hours of lecture and six hours of laboratory per week. Formerly 100B. Classification and epidemiology of refractive errors, evaluation of accommodative and binocular status. Tomometry, advanced techniques of examining the posterior pole, evaluation of visual pathway function. (SP)

200C. Clinical Examination of the Visual System. (4) Two hours of lecture and four hours of laboratory per week. Formerly 200C. Advanced analysis of refractive, accommodative, and binocular anomalies. Pediatric examination techniques. Advanced methods of examining the peripheral ocular fundus; anterior chamber angle evaluation. (F)

200D. Clinical Examination of the Visual System. (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: 200C. Formerly 100D. Modification of the exam sequence for specific patient needs. Evaluation and management of tear film disorders; analysis of vision; visual fields; amblyopia; management and professional communications; legal and ethical issues; managed care and optometry. (SP)

222A. Optics of Ophthalmic Lenses. (3) Three hours of lecture and two hours of laboratory per week. Prerequisites: Vision Science 200A-200B, Formerly 122A. Optical and physical characteristics of ophthalmic lenses, to include spherical and aspheric surfaces of single and multifocal lens designs, and ophthalmic prisms. Lens power measurement methods, lens thickness, and relationships to considerations in designing prescription wear. Characteristics of absorbent lenses, ophthalmic coatings, lens materials, and their role in ocular protection. (F)

222B. Advanced Clinical Optics. (2) Two hours of lecture per week. Prerequisites: 222A. Formerly 122B. Optical properties of ophthalmic lens aberrations, ophthalmic lens designs relating to anisotropia, aniseikonia, and high refractive errors. Optics of the eye.
contact lens optics, and optical principles of low vision aids. Environmental vision and related ophthalmic standards. (SP)

226A. Systemic Pharmacology. (2.5) Two hours of lecture and one hour of discussion per week. Prerequisites: 220D. Formerly 220D. Basic pharmacology, terminology, and concepts (both pharmacodynamic and pharmacokinetic) and pharmacotherapy of medical conditions commonly encountered in clinical optometric practice, including cardiovascular, respiratory disease, diabetes, infection and inflammatory conditions, as well as central nervous system disorders. (F,SP) Wildsoet

226B. Ocular Pharmacology. (2.5) Two hours of lecture and one hour of discussion per week. Prerequisites: 226A. Basic pharmacology, terminology, and concepts (both pharmacodynamic and pharmacokinetic) as applied to the eye and ophthalmic drugs, clinical prescribing issues including formulation, dosing and prescribing, and pharmacotherapy of anti-inflammatory conditions, centrally acting, hormonal and other "specialist" system drugs. (F,SP) Wildsoet

230A-230B. Graduate General Clinical Practice. (2-2-2-6) Course may be repeated for credit. Four hours of lecture per week per unit. Prerequisites: O.D. degree. General optometric practice for four hours per week per credit hour, including optometric examination, dispensing, consultation, and subsequent visits to patients performed independently by graduate student clinicians. (F,SP)

231A-231B. Graduate Specialty Clinics. (2-2-2-6) Course may be repeated for credit. Four hours of clinical per week per unit. Prerequisites: O.D. degree. Clinical examination of patients in designated specialty clinics. Most of one clinical specialty may be taken simultaneously. (F,SP)

236A-236B. Systemic Disease and Its Ocular Manifestations. (3-3) Two hours of lecture and two hours of discussion per week per credit hour. Prerequisites: 200D. 236A is a prerequisite for 236B. The pathophysiology, pharmacologic and clinical management of systemic and ocular diseases will be discussed through a combination of lecture and problem-based learning approaches. Disease processes will be emphasized and include cellular injury and repair, inflammation, infection, degeneration, and neoplasia. Neurologic, cardiovascular, endocrine, pulmonary, and congenital disease and their relative ocular manifestations will be presented. The role of the optometrist in the health care system will be emphasized. (SP)

240. Diagnosis and Treatment of Sensory/Motor Anomalies. (3) Two and one-half hours of lecture per week and 16 hours of laboratory per semester. Prerequisites: 230A-230B. Introduction to the principles of sensory and motor examination, including sensory anomalies and amblyopia. Rational and methods for treatment with lenses, prism, occlusion, and vision training. Design and implementation of treatment programs. (F,SP)

241. Advanced Management and Rehabilitation of Sensory/Motor Anomalies. (3) Two and one-half hours of lecture per week and 16 hours of laboratory per semester. Prerequisites: 240. Formerly 141. Advanced diagnosis and treatment of strabismus, neurologic ocularmotor disorders, amblyopia, and other associated sensory anomalies. Assessment and management of developmental and acquired vision deficiencies in relationship to learning disabilities. Design and implementation of treatment programs. (F)

246. Diagnosis and Treatment of Anterior Segment Ocular Disease. (4) Four hours of lecture per week. Prerequisites: 236B. Formerly 146. This course serves as the pathophysiology of pharmacology, pharmacotherapy, and clinical management of systemic and ocular diseases through a combination of lecture and problem-based learning approaches. Disease processes will be emphasized and include cellular injury and repair, inflammation, infection, degeneration, and neoplasia. Neurologic, cardiovascular, endocrine, pulmonary, and congenital disease and their relative ocular manifestations will be presented. The basic principles of pharmacology will be followed by overviews of drugs used to treat diseases of each system. The role of the optometrist in the health care system will be emphasized. (F)

251. Low Vision. (2.5) Two and one-half hours of lecture per week. Prerequisites: 200D. Formerly 151. Epidemiology and etiology of low vision. Optical principles of low-vision aids. Optometric examination and treatment of the low-vision patient. Interdisciplinary rehabilitation resources, counseling, and referral. (SP)

256. Diagnosis and Treatment of Posterior Segment Ocular Disease. (4) Four hours of lecture per week. Prerequisites: 246. Formerly 156. This course consists of the pathophysiology, pharmacotherapy, and clinical management of systemic and ocular diseases through a combination of lecture and problem-based learning approaches. Disease processes will be emphasized and include cellular injury and repair, inflammation, infection, degeneration, and neoplasia. Neurologic, cardiovascular, endocrine, pulmonary, and congenital disease and their relative ocular manifestations will be presented. The basic principles of pharmacology will be followed by overviews of drugs used to treat diseases of each system. The role of the optometrist in the health care system will be emphasized. (SP)

260A. Contact Lenses: Examination Principles and Practice. (3) Two hours of lecture and two hours of laboratory per week per unit. Prerequisites: 231A-231B. Contact lenses, primary care of patients, performed independently by graduate student clinicians. (F,SP)

270A. Eyecare Business and Professional Management I. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 200B. Ethics in general, and in an optometric setting, in particular, are presented and discussed. Debt management, goal setting, epidemiological trends and health care implications, and microeconomics as it affects the practice of optometry. (SP)

270B. Eyecare Business and Professional Management II. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 270A. Patient scheduling, patient communication, systems design and office flow, accounting and finance in an optometric setting, fee computation techniques. (F)

270C. Eyecare Business and Professional Management III. (2) Two hours of lecture/seminar per week. Prerequisites: 270A. Entrepreneurship, financing alternatives, business loans, human resource, marketing, personal finance, business law as it affects optometry. (SP)

281A-281B. Graduate Clinical Rounds. (1-3;1-3) Course may be repeated for credit. Seminar/patient demonstration. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: O.D. degree. Presentation and discussion of the diagnosis, etiology, prognosis, and treatment of selected clinical cases. (F,SP)

291A-291B. Formerly 450B-450C. Presentation of clinical cases demonstrating basic and advanced optometric care, including diagnosis, treatment, and patient management. (F,SP)

425. Current Concepts in Ocular Disease. (1) One hour of seminar per week. Prerequisites: 440B and 441B. Recent advances in the detection, diagnosis, and management of ocular disease. (SP)

499. Supervised Independent Study. (1-12) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Independent study under control of the Associate Dean for Student Affairs. (F,SP) Staff

Vision Science

Lower Division Courses

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/not pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP) Staff

84. Sophomore Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week for each of two weeks. Sections 1-2 to be graded on a pass/ not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses in which faculty members work with all students across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. Two topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)
199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/no pass basis. Prerequisites: Upper division status and consent of instructor; the student's advisor, student of the departmental chair. Supervised independent study and research. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP) Staff

Graduate Courses

201A-201B. Seminar in Vision Science. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Consent of instructor. Graduate seminar in vision science. (F,SP)

203A. Geometric Optics. (4) Three hours of lecture, two hours of laboratory, and one hour of discussion per week. Formerly 101. Geometrical methods applied to the optics of lenses, mirrors, and prisms. Thin lens eye models, magnification, astigmatism, prism properties of lenses, thin lenses. (F)

203B. Optical System and Physical Optics. (4) Three hours of lecture, two hours of laboratory, and one hour of discussion per week. Formerly 106C. Formerly half of 206A.

205. Visual Perception Sensitivity. (4.5) Three and one-half hours of lecture and two hours of laboratory per week. Formerly 102. Principles of optical systems, principles and clinical applications of apertures and stops, aberrations and optical instruments. Optics of the eye. Selected topics in physical optics, diffraction, interference, polarization. (SP)

206. Visual Cognitive Neuroscience. (2) Three hours of lecture and library assignments per week for five weeks. Prerequisites: Consent of instructor. The course will provide an overview of visual cognitive neuroscience, including knowledge of neural mechanisms of perception and cognition. Topics will include basic anatomy and physiology of the mammalian visual system, motion perception and the processing of visual space, brightness and color, object and face recognition, visual attention, developmental and adult plasticity, perceptual learning, multisensory integration, and visual awareness. (F)

206B. Anatomy and Physiology of the Eye and Visual System. (2) Twenty-six hours of lecture and eight hours of laboratory and one-half weeks. Prerequisites: 206A. Formerly 106B. Structure and function of the tissues of the eye, ocular appendages, and the central visual pathways. Basic concepts of physiology, anatomy, neurological, embryological, and immunological processes as they relate to the eye and vision. Foster an appreciation of the pathophysiology of various disease processes. Convey the importance of anatomy and physiology in the medical approach to ocular disease processes. (F,SP)

206C. Anatomy and Physiology of the Eye and Visual System. (2) Four hours of seminar for seven and one-half weeks. Prerequisites: 206A-206B. Formerly 106C. Problem-based learning approach using clinical case examples. Continuation of 206A-206B. (F,SP)

206D. Neuroanatomy and Neurophysiology of the Eye and Visual System. (2) Four hours of lecture for seven and one-half weeks. Prerequisites: 206A. Formerly 106B. Structure and function of the neurosensory retina, photoreceptors, RPE including blood supply. Current concepts of etiology and management of major retinal conditions. Overview of diagnostic techniques including retinal imaging, electrophysiologic testing and new genetic approaches. Structure and function of the early visual pathway including retinal ganglion cells, optic nerves, lateral geniculate nucleus and visual cortex. Basic principles of signal processing and neural responses. Specialization in the visual cortex. (F) Flannery, Freeman

212A. Optics and Dioptrics of the Eye. (2) Three hours of lecture per week for five weeks plus library assignments. Prerequisites: Consent of instructor. Introduction to fundamental principles of basic and modern geometric optics (thin lens systems, mirrors, prisms, apertures, and stops) and physical optics (interference, diffraction, and polarization) with emphasis on dioptrics of the human eye (including schematic eyes, aberrations, and aberration phenomena). (F)

212B. Visual Neurophysiology and Development. (2) Three hours of lecture per week for five weeks plus library assignment. Prerequisites: Consent of instructor. Introduction to fundamental principles of visual neurophysiology. Visual pathways will be considered from retina to lateral geniculate to visual cortex. Basic organization at each stage will be covered. Primary focus will be studies of retinal field characteristics and associated visual function. Development and plasticity of the same visual pathways will also be covered. Evidence and implications will be explored from controlled rearing procedures and studies of abnormal visual exposure. (F)

212D. Anatomy and Neurophysiology of the Eye. (2) Three hours of lecture per week for five weeks. Prerequisites: Consent of instructor. Introduction to graduate students to sensory aspects of light and color vision including psychophysical methods, spectral response of the eye, mechanisms of sensitivity control, dark adaptation, color discrimination, mechanisms of normal and defective color vision. (SP)

212F. Spatial and Binocular Vision, Eye Movements, and Motion Perception. (2) Three hours of lecture and library assignments per week for five weeks. Prerequisites: Consent of instructor. Introduction for graduate students to sensory aspects of light and color vision including psychophysical methods, spectral response of the eye, mechanisms of sensitivity control, dark adaptation, color discrimination, mechanisms of normal and defective color vision. (SP)

212G. Molecular Genetics of Vertebrate Eye Development and Disease. (2) Three hours of lecture for five weeks. Prerequisites: Graduate student in vision science or consent of instructor in charge. The primary focus of this course will be the molecular basis of vertebrate eye development and related disease. This course will cover some of the basic principles of molecular and cell biology, commonly used techniques and experimental approaches, as well as the biological mechanisms for vertebrate eye development and related eye diseases. Recent progress in identifying important ocular genes and the approaches used to identify them will be discussed. (SP) Gong

215. Visual System Development. (2) Two hours of lecture per week. Prerequisites: 206B. Formerly 111. Development of the eye and visual system. Normal development of the eye, retina, and central visual pathways including development of the optical and visual function in human infants. Refraction and refractive errors in infants and children. Development of visual motor function, spatial vision, color vision, binocular vision, and depth perception. (SP)

217. Ocoulomotor Functions and Neurology. (2) One and one-half hours of lecture and one hour of laboratory per week. Prerequisites: 206B or consent of instructor. Formerly 117. Neuro-anatomical pathways for the control of eye position and movement; gaze holding, image stabilization, and extrinsic eye movement systems; ocoulomotor signs of disorders of the central nervous system (palsies, nystagmus, ophthalmoplegia, cog-wheel pursuits, saccadic dysmetria); the near-visual-motor response and the synergistic control of accommodation and convergence; ocular misalignment (heterophoria and fixation disparity); and presbyopia. (SP)

219. Binocular Vision and Space Perception. (2) One and one-half hours of lecture and 10 hours of laboratory per week. Prerequisites: 203A-203B. Formerly 118. Perception of distance. Binocular retinal correspondence, horopters, differential magnification effects and anomalies of binocular vision development. Sensory vision, local and absolute static and dynamic stereopsis, binocular depth cues. (SP)

230. Ethics in Scientific Research. (2) Thirty hours of seminar per semester. This course will examine a range of ethical issues that arise in the process of doing science. Beginning with the philosophical and social foundations, we will consider the pathologies of fraud, statistics and deception, the ethics of authorship and publication, research with human subjects, the use of animals, the definition(s) of misconduct and the difference between misconduct and questionable research practices, the relationship between industry and science, and, finally, the responsibilities and obligations of the scientist in society. (F)

262. Visual Cognitive Neuroscience. (2) Course may be repeated for credit and may be taken concurrently. Formerly half of 206A.

265. Neural Computation. (3) Three hours of lecture per week. Prerequisites: Calculus, differential equations, basic probability and statistics, linear algebra, and familiarity with high-level programming languages such as MATLAB. Formerly 265. This course provides an introduction to the theory of neural computation. The goal is to familiarize students with the major theoretical frameworks and models used in neuroscience and psychology, and to provide hands-on experience in using these models. Topics include neural network models, supervised and unsupervised learning rules, associative memory models, probabilistic/graphical models, and models of neural coding in the brain. (F)

265. Neural Computation. (3) Three hours of lecture per week. Prerequisites: Calculus, differential equations, basic probability and statistics, linear algebra, and familiarity with high-level programming languages such as MATLAB. Formerly 265. This course provides an introduction to the theory of neural computation. The goal is to familiarize students with the major theoretical frameworks and models used in neuroscience and psychology, and to provide hands-on experience in using these models. Topics include neural network models, supervised and unsupervised learning rules, associative memory models, probabilistic/graphical models, and models of neural coding in the brain. (F)

265. Neural Computation. (3) Three hours of lecture per week. Prerequisites: Calculus, differential equations, basic probability and statistics, linear algebra, and familiarity with high-level programming languages such as MATLAB. Formerly 265. This course provides an introduction to the theory of neural computation. The goal is to familiarize students with the major theoretical frameworks and models used in neuroscience and psychology, and to provide hands-on experience in using these models. Topics include neural network models, supervised and unsupervised learning rules, associative memory models, probabilistic/graphical models, and models of neural coding in the brain. (F)

270. Computer Vision. (3) Three hours of lecture per week. Prerequisites: Knowledge of linear algebra and calculus. Mathematics 1A-1B, 53, 54, or equivalent. Designed for computer science students with a background in human visual perception. Mathematical techniques for representing and reasoning, with curves, surfaces and volumes. Illumination and reflectance models. Image formation. Image and video understanding. Methods for bottom-up 3-D shape recovery; Line drawing analysis, stereo, shading, motion, texture. Use of object models for prediction and recognition. Also listed as Computer Science C280. Malik
Program in Peace and Conflict Studies
(Peace and Conflict Studies)

Peace and Conflict Studies (PACS) has been an undergraduate major at Berkeley since 1985. The founding premise of PACS is that war and other forms of violence, despite their ubiquity, can be mitigated and transformed through the application of knowledge. To this end, the major introduces students to critical analyses of the social, economic, political, and ecological structures of conflict, power, and processes of change. Given the complex and multifaceted nature of violence and its causes, students are expected to approach their studies from a number of interdisciplinary perspectives.

PACS majors are encouraged to develop an integrative understanding of peace theory, research, and practice, taking advantage of internship opportunities in both local and global settings. The PACS curriculum is designed to provide students with breadth and depth in their study of peace and conflict. Breadth is accomplished by the survey fields and depth through the area of concentration.

In consultation with an adviser, students choose courses that will fulfill major requirements. All students are required to fulfill a common set of core courses: Introduction, Methodology, Theory, and the Senior Seminar, as well as a Concentration. Areas of concentration include human security, global governance, culture and identity, human rights, conflict resolution, and nonviolence. Any one of these six may also be combined with a regional focus. Areas of concentration may be combined or reconstituted in special cases by petition to the program chair.

The Group Major

Declaring a major in peace and conflict studies follows guidelines established by the College of Letters and Science. Students wishing to declare PACS: (1) must be currently enrolled in or have completed PACS 10 with a grade of C or better (PACS 10 is a prerequisite once in order to obtain a grade of C or better); (2) have a major and cumulative GPA of 2.0 or higher; (3) must have attended a major declaration workshop; (4) must not be in their final semester of undergraduate work; and (5) are encouraged, but not required, to have completed at least two semesters of college-level foreign language or the equivalent before applying to the major.

Students are reminded that: (1) no coursework for the major may be taken on a satisfactory/unsatisfactory basis, and (2) no course may be used to satisfy more than one major requirement.

Double Majors. Double majors must be approved by the dean of the College of Letters and Science. No more than two upper division courses may be used to satisfy both PACS and a second major.

Courses Outside L&S. No more than three courses outside the College of Letters and Science may be used to fulfill group major requirements.

Study Abroad. The use of coursework taken at institutions outside the United States to fulfill major requirements is restricted to the equivalent of three semester-length upper division courses. Courses taken to fulfill the foreign language requirement for the group major are not included in this restriction.

Transfer Courses. A maximum of three upper division courses taken at other institutions (including those of the UC Education Abroad Program) may be transferred into the major. These courses will be accepted only as three of the required upper division courses (regardless of unit value) and must be validated by the Office of Undergraduate Admissions. Courses used to fulfill lower division language requirement or the foreign language requirement are not included in this restriction.

Honors Program. To graduate with honors from the group major, students must enroll in the two-semester honors seminar, IAS H102 (fall only) and PACS H195 (spring only), and must obtain GPAs of 3.6 in the major and 3.5 in overall University course work. The honors program (PACS H195) is taken in addition to a student’s regular coursework for fulfilling requirements for the major and culminates in the writing of a senior thesis. The thesis is read by the PACS H195 instructor and at least one other faculty member who is selected by the student in consultation with the thesis instructor. Eligibility for participating in the Honors Program is determined in the IAS office. Note: There is no guarantee that students accepted into the Honors Program will graduate with honors. Honors recommendations are made after graduation and are based on the student's GPA and other factors. Students must meet the language, GPA, and overall University course work requirements of the UC Education Abroad Program in order to be considered for the honors program.

Course Plan

There is considerable flexibility within PACS for students to construct individual programs unique to their intellectual interests. There is, however, a structure built around core course requirements that must be met. This structure is designed to provide all PACS students with a common knowledge base and intellectual refer- ence points. Students are strongly recommended to follow the program sequentially, beginning with the lower division courses, followed by the methodology, survey, and concentration courses.

The program begins with lower division courses centered around PACS 10, Introduction to Peace and Conflict Studies, which provides a basic factual, theoretical, and methodological grounding in peace and conflict studies. Two other lower division courses must be chosen from the list below. There is also a language proficiency requirement which, depending on one’s language skills, could require language courses.

The upper division courses include two core courses, including a senior seminar; three survey courses; and methods concentration courses. Students may also enroll in the Honors Program (described above).

Lower Division (3 courses). PACS 10 and two courses from the following list: Anthropology 3, 3AC, 12AC; Asian Studies 10; Development Studies C10; Economics 1, 2; Geography 4, 10, 15, 20, 40, C32, C55; History 6B, 7B, 8B, 9, 10, 11, 12, 14; International and Area Studies 45; Latin American Studies 10; Middle Eastern Studies 20; Near Eastern Studies C26; Political Science 2; Psychology 1; Sociology 1, 3, 3AC; Undergraduate Business Administration 10.

Foreign Language. All PACS students must be able to demonstrate proficiency in one single modern language (other than English) equivalent to four college-level semesters.

There are three ways students can fulfill the four-semester language requirement, depending on their backgrounds and abilities:

(1) Through coursework. Any combination of college courses, summer programs, or college-level College courses, summer programs, or college-level study abroad programs that language courses equivalent to the language requirement. At a minimum, students must complete the fourth semester of a language with a grade of C- or better. The first, second, or third levels of language may be taken on a pass/not passed basis; the fourth semester must be taken for a letter grade. Language courses need not be taken at Berkeley; courses taken at a community college or any accredited school or university are acceptable. Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided. See an adviser in the IAS office concerning language study abroad.

(2) With a proficiency exam. Students whose language skills are at fourth semester or beyond and who do not wish to take courses can opt to test out of this requirement. However, not all of Berkeley’s language departments offer proficiency exams. See a PACS adviser about specific departmental policies.

(3) Being a non-native English speaker. Non-native speakers of English may use their native language to satisfy this requirement; however, documentation of fourth semester of college-level language proficiency exams. Students may be transferred into the major after completion of four college-level semesters. See a PACS adviser about specific departmental policies.

Upper Division:

Core (2 courses). PACS 100, Peace Theory: Approaches and Analyses and PACS 190, Senior Seminar. These courses provide the scope of the discipline in historical, theoretical and practical terms.

Methods (1 course). The methodology requirement is designed to give each PACS major a set of methodological tools and analytical skills appropriate to the core focus of their individual program. The methods course can be drawn from any of two broad categories—statistical methods or research design. The selection of a methods course most appropriate for each student should be undertaken in close consultation with an adviser. Students are strongly encouraged to take the methods course in the junior year, before the major program becomes too diversified.
with an adviser. The first category focuses on advanced statistical methods and computer-assisted data analysis. A lower-division statistics course is strongly recommended as a prerequisite to any of these courses. The second category focuses on research design and field methods. It is oriented to questions of survey design, field analysis, questionnaire design, and writing skills, which support research design. An introductory course in statistics is also recommended as a prerequisite to these courses. Lists of approved courses can be obtained from the IAS office.

Concentration (4 courses). In the concentration, students must take a supervised independent study on a particular issue or topic in peace studies. Concentrations can be chosen from one of six pre-defined categories: (1) human security; (2) global governance; (3) culture and identity; (4) human rights; (5) conflict resolution; and (6) nonviolence. Concentrations can also be self-defined: in consultation with a faculty adviser, students may develop their own concentration and propose the courses that will inform them about their topic. Students who wish to self-define their concentration must submit a PACS Self-Defined Concentration Approval form that must be approved by the PACS chair and submitted to an IAS major adviser with the application to the major.

Survey (2 courses). Each survey course is chosen from two of the six topics listed above under Concentration. Neither the two survey topics, nor the courses used to satisfy the survey requirements, can overlap with those chosen for the concentration. For example, if the concentration topic is human security, human security cannot be chosen for either of the survey topics, nor can courses be double-counted for the Survey and Concentration requirements. A list of courses can be obtained from the IAS office.

The Minor

The PACS minor is open to all undergraduates except PACS majors. Applications for the minor and a list of approved courses are available from the IAS office. To apply for the minor, students must have completed at least one PACS course with a grade of B or better and have an overall GPA of 2.0. Completed applications and a Petition for Confirmation of Minor Program must be submitted to the IAS office no later than the last day of instruction of the term immediately preceding your final semester.

To complete the minor, students must take six upper division courses, three of which must be PACS courses. In addition, one course must be selected from one (only) of the six PACS Concentration/Survey Areas.

Note: The following college requirements apply to the PACS minor program: (1) at least three courses must be completed at Berkeley; (2) all courses must be letter graded; and (3) a minimum GPA of 2.0 must be achieved in the courses used to satisfy the minor requirements; and (4) no more than one course can satisfy requirements for both a major and a minor.

Lower Division Courses

10. Introduction to Peace and Conflict Studies. (4) Four hours of lecture and one hour of discussion per week. This course introduces students to a broad range of issues, concepts, and approaches integral to the study of peace and conflict. Subject areas include the inter-system and war prevention and intervention, resolution and nonviolence, human rights and social justice, development and environmental sustainability. Required of all peace and conflict studies majors. (F,SP) Sanders

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. (F,SP) Staff

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: At discretion of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

94. Theory and Practice of Meditation. (1) Course may be repeated for credit. Two hours of discussion and practice per week. Must be taken on a passed/not passed basis. A program for systematically reducing random activity in the mind, with comparative studies of relevant texts from monastic and householder traditions, East and West. (F,SP)

98. Directed Group Study. (1-3) Course may be repeated for credit. One hour of lecture/group discussion per unit for five weeks. Sections 1-2 to be taken on a passed/not passed basis. Group discussion, research and reporting on selected topics. (F,SP)

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Tutorial. Must be taken on a passed/not passed basis. Prerequisites: Lower division standing; GPA 3.4 or better; consent of instructor, adviser, and departmental chair; usually restricted to PACS majors. Supervised independent study or research on topics relevant to PACS not covered in depth by other courses. A proposal must be formulated in consultation with the faculty sponsor with clearly stated objectives and means of implementation. (F,SP)

Upper Division Courses

100. Peace Theory: Approaches and Analyses. (3) Three hours of lecture per week. Prerequisites: 10. This course will explore the historical development of the field through analysis of the operative assumptions, logic, and differing approaches of the seminal schools and thinkers that have shaped the field. Students will be required to read and engage in class discussion of literature and major debates in peace studies and research. (F,SP) Sanders

119. Special Topics in Peace and Conflict Issues. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Course will focus on specific issues of current research and issues in the field of peace and conflict studies. Topics will be different each term and reflect the current research of the instructor. Students will be required to do extensive reading on a weekly basis, participate in assigned projects, and complete one major research project and class presentation. Actual assignments may vary from term to term depending upon the subject. (F,SP)

125AC. War, Culture, and Society. (4) Four hours of lecture per week. This course examines the experience and meaning of war in the formation of American culture and society. It considers the profound influence war has had in shaping the identities and life chances of successive generations of American men and women. It will take special note of the role of race, ethnicity, and class as prisms that filter this process. This course also explores how different interpretations of democracy and capitalism have served as a catalyst for social conflict and change in racial and ethnic identity and relations, especially as reflected in war. This course satisfies the American Cultures requirement, (SP)

126. International Human Rights. (4) Three hours of lecture per week. This course provides an overview to the historical, theoretical, political, and legal underpinnings that have shaped and continue to shape the development of human rights. Students are introduced to substantive topics within human rights and provided an opportunity to develop critical thinking, oral, and written communication skills. We examine the concept of human rights originates, how these ideas have been memorialized in international declarations and treaties, how they develop over time, and how they are enforced and monitored. We examine a variety of issues and encourage students to think differently—to analyze world and community events through a human rights framework utilizing some of the necessary tools to investigate, research, and think critically about human rights and the roles these play within this arena. The course requires two six-page papers, participation in a team debate, and an independent reading assignment. (F,SP)

127. Human Rights and Global Politics. (4) Three hours of lecture and one hour of discussion per week. Formerly 127B. After World War II, we witnessed a “revelution” in human rights theory, practice, and institution building. The implications of viewing individuals as equal and endowed with certain rights is potentially far reaching as in the declaration that individuals hold many of those rights irrespective of the views of their government. Yet, we also live in a world of sovereign states with sovereign state’s rights. We see every day a clash between the rights of the individual and lack of duty to fulfill those rights when an individual’s home state is unwilling or unable to do so. After introducing the idea of human rights, its history and scope and various human rights mechanisms, this course will ask what post-World War II conceptions of human rights mean for a number of specific issues including humanitarian intervention, international criminal justice, U.S. foreign policy, immigration, and economic rights. Looking in depth at these five areas, we will ask how ideas about human rights, laws about human rights, and institutions to protect human rights have on how states and other global actors act, and how individuals have fared. (F,SP)

128AC. Human Rights and American Cultures. (4) Four hours of lecture per week. This course analyzes the theory and practice of human rights for three groupings in the United States and examines questions of race and ethnicity as they are embedded in various international human rights instruments. The course utilizes an interdisciplinary approach to the study of developing systems, laws, and norms for the promotion and protection of human rights while considering each group’s underlying political, literary, and cultural traditions. This course satisfies the American Cultures requirement. (F,SP)

130. Cross-Listed Topics. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Prerequisites: Consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to peace and conflict studies majors. (F,SP)

135. Special Topics in Regional Conflict. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Topics vary, quarter to semester. The course provides an interdisciplinary study of geo-political regions and the sources of their conflicts. (F,SP)

149. Global Change and World Order. (3) Three hours of lecture per week. This course will analyze emerging trends, patterns, and problems associated with the interaction of globalization and global governance. This attention will be given to world economic and social integration, ethno-religious nationalism and identity politics, domestic politics, and foreign policy. Special emphasis will be placed on the prospects of peace and world order in the post-Cold War era. (F,SP) Sanders

150. Conflict Resolution: Theory and Practice. (3) Three hours of lecture per week. This course will investigate theories of individual and group conflict as a conceptual framework for practical application.
Students will engage in practice as parties to conflicts and as third-party interveners. The course will look at the sources of conflict, including multicultural aspects, and at the opportunities for growth and development in conflictive incidents. (F.S.P)

150AC. Conflict Resolution: Theory and Practice. (3) Students will receive no credit for 150AC after taking 150. Three hours of lecture per week. This course explores the nature of interpersonal and group conflict and the resolution of the conflicts over seven weeks. The course examines the intersection between conflict and race and ethnicity in particular, with an emphasis on the major racial/ethnic groups in the United States. Other relevant cultural diversity such as gender, class, and sexual orientation in conflict situations are also explored. The goal is to apply this understanding to resolving intercultural conflicts through mediation. This course satisfies the American Cultures requirement. (F.S.P)

151. International Conflict: Analysis and Resolution. (3) Three hours of lecture per week. Inspired by the changing meaning of international conflict and the expanding mission of conflict resolution in the post-Cold War era, this course will study the contemporary context and issues of conflict by examining the evolution in thinking about conflict, the resolution, and their application in practice. (F.S.P) Sanders

154. Multicultural Conflict Resolution. (4) Students will receive no credit for 154AC after taking 154. Three hours of lecture per week. Prerequisites: 150 and 153, or consent of instructor. This course will investigate the special issues involved with facilitating resolution of cross-cultural conflicts. Topics will include cultural communication, interpretation, and problem solving styles, mediator (facilitator/negotiator) credibility, cultural (including gender) contributions to conflict resolution, and unique ethical dilemmas. Course includes field immersion, conflict resolution process evaluation and design, and the opportunity to participate in mediation of a cultural mediation. (F.S.P)

154AC. Multicultural Conflict Resolution. (4) Students will receive no credit for 154AC after taking 154. Three hours of lecture per week. Prerequisites: 150 and 153, or consent of instructor. This course will investigate the special issues involved with facilitating resolution of cross-cultural conflicts. Topics will include cultural communication, interpretation, and problem solving styles, mediator (facilitator/negotiator) credibility, cultural (including gender) contributions to conflict resolution, and unique ethical dilemmas. Course includes field immersion, conflict resolution process evaluation and design, and the opportunity to participate in mediation of a cultural mediation. (F.S.P)

157. Practicum in Peace and Conflict Studies. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: 150, 153, 154, 155, and consent of instructor. This course provides the opportunity to apply, analyze, and evaluate the results of applying collaborative conflict resolution theory and models in supervised internships. Activities and materials will be designed to assist students with developing skill and understanding with a focus on ethics and culture while completing specific substantive requirements for neutrals. (F.S.P)

159. Conflict Resolution Intensive Training. (3) Course may be repeated for a maximum of 6 units. Offered each week for several weeks. This course provides intensive experiential training in conflict resolution and mediation techniques. Participants are provided with the opportunity to apply, analyze, and evaluate the results of applying conflict resolution mediation theory and models presented in other conflict resolution coursework. Participants will develop and refine mediation techniques and skills through participation and observation of exercises and case studies specifically designed to focus on types and structures of inter- ventions, roles and relationships, negotiation, and cultural diversity. (F.S.P)

164A. Introduction to Nonviolence. (3) Students will receive 2.4 units for 164A after taking 164. Three hours of lecture per week. An introduction to the science of nonviolence, mainly seen through the life and work of Mahatma Gandhi. Historical overview of nonviolence to the East and the West up to the American Civil Rights Movement and Martin Luther King Jr., with emphasis on the ideal of principled nonviolence and the reality of mixed or strategic nonviolence in practice, especially as applied to problems of social justice and defense. (F.S.P)

164B. Nonviolence Today. (3) Students will receive 2.4 units for 164B after taking 164. Three hours of lecture per week. Prerequisites: 164A or consent of instructor. The development of nonviolence since the Civil Rights Movement. Nonviolent theory and practice seen in recent insurrectionary movements (freedom struggles), social justice struggles, nonviolent intervention across borders and protection of the environment in the emerging world of global corporatism. (F.S.P)

170. Conflict Resolution, Social Change, and the Cultures of Peace. (4) Three hours of lecture per week. A comprehensive exploration of the concepts and processes of conflict resolution, using this term in both its broadest and narrowest sense. In particular, the course elaborates upon the relationships among conflict resolution, social change, and cultures of peace with examples drawn from the domestic and global levels. (SP)

190. Senior Seminar. (3-4) Three hours of seminar per week. Prerequisites: Senior standing. Course should be taken in final year of study and is only open to PACS majors. Students prepare a major analytical paper synthesizing what they have learned in the major and give an oral presentation on their area of concentration. Students review literature and issues of peace and conflict studies appropriate to focus of senior paper and participate in regular consultations with instructors. Weekly progress reports and written papers required. All students will be expected to read and critique a common core of literature as well as readings specific to their concentration. (F.S.P)

195. Senior Thesis. (3-4) Three hours of research per unit per week. Prerequisites: Senior standing in PACS. Research paper or suitable research project done under the direct supervision of a faculty sponsor. Subject must be approved by faculty sponsor no later than the previous semester in which the course is to be taken. (F.S.P)

H195. Senior Honors Thesis Seminar. (4) Three hours of seminar and one hour of consultation per week. Prerequisites: Senior standing; 3.6 GPA in major; 3.5 GPA overall in coursework undertaken at Berkeley; International and Area Studies 102, and consent of instructor. Students are required to research and write a thesis based on the prospectus developed in International and Area Studies 102 or a prospectus developed by the instructor before the first class meeting. The thesis work is conducted in regular consultation with the honors seminar instructor and a second topic expert reader to be selected based upon the thesis topic. Weekly progress reports and written work are required. (SP)

197. Field Studies. (1-4) Course may be repeated for credit. Fieldwork and independent meetings with faculty sponsor. Must be taken on a passed/not passed basis. Upper division standing, consent of instructor and PACS chair. Supervised experience relevant to specific aspects of peace and conflict studies in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (SP)

198. Directed Group Study for Upper Division Students. (1-3) Course may be repeated for credit as topic varies. Variable. Must be taken on a passed/not passed basis. Prerequisites: 2.0 GPA, upper division standing. Group discussion, research, and reporting on selected topics. Students initiation in choice of subjects is solicited and welcome. (F.S.P)

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Tutorial. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. Supervised independent study or research on topics relevant to peace and conflict studies that are not covered in depth by other courses. Topics to be covered are initiated by students. (F.S.P)

Philosophy

(205C prefix=honors course
AC suffix=course satisfies American Cultures requirement
R prefix=course satisfies R&C requirement
W prefix=online course
*Professor of the Graduate School
†Recipient of Distinguished Teaching Award

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Chair: Paolo Mancosu, Ph.D.

Professors
Janet Broughton, Ph.D.
John Campbell, D.Phil
Hannah Ginsborg, Ph.D.
John MacFarlane, Ph.D.
Paolo Mancosu, Ph.D.
Alva Noe, Ph.D.
John R. Searle, D.Phil.
Hans Sluga, B.Phil.
Barry G. Stroud, Ph.D.
R. Jay Wallace, Ph.D.
Charles S. Chihara (Emeritus), Ph.D.
Thompson Clarke (Emeritus), Ph.D.
Katherine Garmey, Ph.D.
William Craig (Emeritus), Ph.D.
Hubert L. Dreyfus (Emeritus), Ph.D.
Wallace I. Matson (Emeritus), Ph.D.
David Rynin (Emeritus), Ph.D.
Frits Staal (Emeritus), Ph.D.
Bruce J. Vermazen (Emeritus), Ph.D.

Associate Professors
Nicholas Kolody, Ph.D.
Sherrilyn Roough, Ph.D.
Daniel Warren, Ph.D., M.D.

Assistant Professors
Lara Buchak, Ph.D.
Geoffrey Lee, Ph.D.
Seth Yalon, Ph.D.

The Major

Lower Division. 12A, 25A, and 25B.

Upper Division. 100; one of the following: 104, 105, 107, 115; and two courses from the following four groups (no more than one course from any group can be repeated for credit): Group A: 122
Group B: 125
Group C: 131, 132
Group D: 133, 135

A total of 48 units is required in the major program. Twenty units are required in the upper division, with the four required upper division courses. Students must take one course from the 160-178 series, one course from the 160-187 series, and three additional upper division courses. Course 101 does not count towards the major.

Students should pass Philosophy 12A before the end of the junior year and should take Philosophy 100 as soon as possible after declaring the major. One of the three additional upper division courses may be taken in another department, but the course selected is deemed by the major adviser to be relevant to the major. One course in the major may be taken on a passed/not passed basis.

Three additional upper-division philosophy courses are required.

Honors Program. With the consent of the major adviser, a student with an overall 3.5 GPA or higher and a GPA of 3.7 or higher in courses in the major may apply for admission to the Honors Program. This program requires completion of either: (1) Philosophy H196, Senior Colloquium, or (2) a graduate seminar in the Department of Philosophy, admittance to which is contingent upon approval of the instructor in charge. It also requires
that the candidate write an acceptable honors thesis, for which four units of credit will be given under Philosophy H195.

The Minor

Required: Philosophy 25A or 25B; one of the following four courses: 104, 105, 107, 115; one of the following six courses: 122, 125, 131, 132, 133, 135; three additional upper division courses in philosophy (excluding Philosophy 101). A minimum of three of the upper division courses must be taken at Berkeley. All courses taken in the minor must be completed with a grade of C- or higher. Students must have an overall GPA of 2.0 in all six courses required for the minor. (A GPA of 2.0 must be maintained within the five upper division courses as well.)

Lower Division Courses

2. Individual Morality and Social Justice. (4) Three hours of lecture and one hour of discussion per week. Introduction to ethical and political philosophy. (F,S,P) Staff

3. The Nature of Mind. (4) Three hours of lecture and one hour of discussion per week. Introduction to the philosophy of mind. Topics to be considered may include the relation between mind and body; the nature of action; the nature of desires and beliefs; the role of the unconscious. (F,S,P) Staff

4. Knowledge and Its Limits. (4) Three hours of lecture and one hour of discussion per week. Introduction to the theory of knowledge. (F,S,P) Staff

5. Science and Human Understanding. (4) Three hours of lecture and one hour of discussion per week. Introduction to the philosophy of science. Staff

6. Man, God, and Society in Western Literature. (4) Three hours of lecture and one hour of discussion per week. Philosophical issues as expressed in poetry, drama, and the novel. This course will compare and contrast the Greek, medieval, and modern worlds, as reflected in their greatest literature, with special emphasis on the role of the community in reconciling conflicts between sub-groups in society and the individual's ability to understand and control his own life. We will also follow man's realization that the changing answers to these questions are themselves self-interpreted. (F,S,P) Staff

7. Existentialism in Literature and Film. (4) Three hours of lecture and one hour of discussion per week. Christian, Marxist, and existentialist existentialism as expressed in the works of Dostoyevsky, Melville, Kafka, Antonioni, Goddard, etc. (F,S,P) Staff

11. Introduction to the Philosophy of Religion. (4) Three hours of lecture and one hour of discussion per week. A survey of basic issues in contemporary philosophy of religion, exploring arguments about God's existence, the status of religious experiences and beliefs, how souls might interact with bodies, and the relationship of God to morality. (F,S,P) Staff

12A. Introduction to Logic. (4) Three hours of lecture and two hours of discussion per week. Syntax, semantics, and proof theory of sentential and predicate logic. (F,S,P) Staff

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/failed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. Staff

25A. Ancient Philosophy. (4) Three hours of lecture and one hour of discussion per week. The history of ancient philosophy with an emphasis on the Pre-Socratics, Plato, and Aristotle. (F) Staff

25B. Modern Philosophy. (4) Three hours of lecture and one hour of discussion per week. The history of modern philosophy from Descartes through Kant. (SP) Staff

39. Freshman Seminar. Course may be repeated for credit. Three hours of seminar per week. Study of various fields of philosophy of special interest to freshman. Topics will vary from semester to semester and will be individually announced. Freshman seminars are restricted to 15 students each. Staff

Upper Division Courses

100. Philosophical Methods. (4) Two hours of lecture and two hours of discussion per week. Prerequisites: Two courses from 2, 25A, 25B. Restricted to students in the major. The course is designed to acquaint students with the techniques of philosophical reasoning through detailed study of selected philosophical texts and through extensive training in philosophical writing, based on those texts. Should be taken as early as possible after declaring the major. (F,S,P) Staff

104. Ethical Theories. (4) Three hours of lecture and one hour of discussion per week. Formerly C104. The fundamental concepts and problems of morality examined through in-depth analysis of contemporary philosophical theories of ethics. (F,S,P) Staff

107. Moral Psychology. (4) Three hours of lecture per week. An investigation of central issues in moral psychology, such as free will, weakness of will, self-deception, moral motivation, emotions, virtues, and moral education. (F,S,P) Staff

108. Contemporary Ethical Issues. (4) Course may be repeated for credit with consent of instructor if the content changes sufficiently. Three hours of lecture and one hour of discussion per week. Prerequisites: 2 or 104, or two courses in philosophy, or consent of instructor. This in-depth discussion of a variety of problems in moral philosophy raised by real-life questions of individual conduct and social policy. Its contents will vary from occasion to occasion. Possible topics include philosophical problems posed by affirmative action, abortion, euthanasia, capital punishment, terrorism, war, poverty, and climate change. (F,S,P) Staff

109. Freedom and Responsibility. (4) Three hours of lecture per week. A systematic examination of freedom and responsibility. The following topics will be addressed (among others): the relations between freedom of will, freedom of action, and autonomy; moral responsibility and its conditions; naturalism, determinism, and other theories of responsibility; practical deliberation and the structure of the will; and weakness and strength of will. Readings may be drawn from both historical and contemporary sources. (F,S,P) Staff

110. Aesthetics. (4) Three hours of lecture per week. Prerequisites: Upper division courses in philosophy or consent of instructor. Majors in literature or the arts. Visual arts, literature, and music. Form, expression, representation style; interpretation and evaluation. Staff

114. History of Political Philosophy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One course in philosophy. A survey of the major political philosophers, including some or all of Plato, Aristotle, Hobbes, Locke, Rousseau, Kant, Bentham, Mill, and Marx. (F,S,P) Staff

115. Political Philosophy. (4) Three hours of lecture and one hour of discussion per week. Analysis of political obligation and related problems. (F) Staff

116. Special Topics in Political Philosophy. (4) Three hours of lecture per week. Prerequisites: 115 or equivalent. This course is designed to deal with a variety of topics in political philosophy. Its contents will vary from occasion to occasion. Possible topics include problems in liberal theory; justice, desert, and responsibility; communitarianism, nationalism, and cosmopolitanism. Staff

122. Theory of Knowledge. (4) Three hours of lecture and one hour of discussion per week. Staff

125. Metaphysics. (4) Three hours of lecture per week. Staff

128. Philosophy of Science. (4) Three hours of lecture and one hour of discussion per week. A survey of the main issues in the philosophy of science and of other issues coming under the general heading of philosophy of science. (F,S,P) Staff

130. Philosophy of Social Science. (4) Three hours of lecture per week. Philosophical topics arising from psychology, economics, sociology, etc. Staff

132. Philosophy of Mind. (4) Three hours of lecture per week. Mind and matter; other minds; the concept “person.” Also listed as Letters and Science C160T. (F,S,P) Staff

133. Philosophy of Language. (4) Three hours of lecture per week. (F,S,P) Staff

135. Theory of Meaning. (4) Three hours of lecture per week. Prerequisites: Upper division courses in logic or consent of instructor. Language as social behavior. Language compared to other sign systems. The foundations of semantics, truth, meaning, reference. Issues in logical form in language. (F,S,P) Staff

136. Philosophy of Perception. (4) Three hours of lecture per week. Prerequisites: One previous course in philosophy is recommended. The philosophy of perception is a microcosm of two of philosophy's central problems—What is perception? What is the nature of perceptual consciousness? How can one fit an account of perceptual experience into a broader account of the nature of the world?—are problems at the heart of metaphysics. It is often justifiably said that the theory of perception (and especially vision) is the area of psychology and neuroscience that has made the greatest progress in recent years. Despite this progress, or perhaps because of it, philosophical problems about perception retain a great urgency, both for philosophy and for science. (F,S,P) Staff

138. Philosophy of Society. (4) Three hours of lecture and one hour of discussion per week. This course deals with the ontology of society and thus provides a foundation for the social sciences. The main questions discussed are: (1) What is the mode of existence of social reality? (2) How does it relate to psychological and physical reality? (3) What implications does social ontology have for social explanation? (F,S,P) Staff

C138. Philosophy of Society. (4) Three hours of lecture and one hour of discussion per week. This course deals with the ontology of society and thus provides a foundation for the social sciences. The main questions discussed are: (1) What is the mode of existence of social reality? (2) How does it relate to psychological and physical reality? (3) What implications does social ontology have for social explanation? Also listed as Letters and Science C160U. (F,S,P) Staff

140A. Intermediate Logic. (4) Three hours of lecture per week. Major concepts, results, and techniques of modern logic. Basic set theoretic tools. Model theory and applications. (F,S,P) Staff

140B. Intermediate Logic. (4) Three hours of lecture per week. Prerequisites: 140A or equivalent. Major concepts, results, and techniques of modern logic. Turing machines, computability theory, decidability, first-order logic, proof theory, Godel's first and second incompleteness theorems. (F,S,P) Staff

141. Philosophy and Game Theory. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: One course in philosophy. An exploration of
Three hours of lecture and one hour of staff.

170. Kant. (4)
178. Descartes. (4)
161. Aristotle. (4)
160. Plato. (4)

A comparative study of Confucianism, Taoism, and Chinese ethical theory and the role of language in philosophy from late Chou times through the Ch'ing dynasty. One unit per weekly hour of instruction. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Directed study on special topics. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Tutorial. One unit per weekly hour of instruction. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Directed study on special topics. (F,SP) Staff

200. First-Year Graduate Seminar. (3) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. A combination seminar and tutorial, required of and limited to first-year graduate students in philosophy. (F) Staff

250. Special Studies. (1-9) Course may be repeated for credit. Tutorial. Prerequisites: Admission to candidacy for the doctoral degree. (F,SP) Staff

251. Directed Studies. (1-9) Course may be repeated for credit. Tutorial. Prerequisites: Consent of instructor. Open to graduate students interested in taking courses or pursuing special study or research under the direction of a member of the staff. (F,SP) Staff

290. Seminar. (3) Course may be repeated for credit. Two hours of seminar per week. Advanced study in various fields of philosophy. Topics will vary from semester to semester. (F,SP) Staff

295. Dissertation Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to graduate students who have satisfied the requirements for doctoral degree. Independent study. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

301. Professional Preparation: The Teaching of Philosophy. (2-6) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as a graduate student instructor. Students will work as teachers under the guidance of a faculty member. They will attend lectures, guide classroom discussion, and participate in a workshop in teaching methods. (F,SP) Staff

302. Graduate Student Instructor Teaching Seminar. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisite: Admission to Ph.D. program. A hands-on training seminar for new philosophy GSIs that addresses both practical and theoretical issues. (F) Staff

Physical Education

(College of Letters and Science)

Office: 200 Hearst Gymnasium, (510) 642-3289
pe.berkeley.edu
Director: M. Kathryn Scott, M.A.
Supervisors of Physical Education
M. Kathryn Scott, M.A.
Alvin R. Kyle (Emeritus), Ed.D.
Kuang Min (Emeritus), M.Ed., Ph.D. (hon.)
Lecturers
Russell Ahn, Ph.D.
Jason Britton, M.F.A.
Justin Caraway, M.A.
Sue Johannessen, M.A.
Susan U-Jool, M.F.A.
Toni Mar, M.S.
Richard Morris, M.S.
Lori Rokk, M.S.
Elmar Stelke, M.A.
Dini Wong, M.A.

Diving Safety Officer
Jim Hayward, B.A.

Program Overview

The Physical Education Program is under the jurisdiction of the College of Letters and Science and reports to the college through the Dean of Biological Sciences. The program consists of a wide range of physical activity classes as well as various lecture/laboratory courses described in the course listings. The physical activity offerings are designed to provide sequenced instruction in such classes as aquatics, combatives, dance, fitness, and sports. Instruction is planned to enable participants to develop and improve performance skills, gain knowledge and concepts relevant to the activity, receive relevant information concerning the health benefits of regular exercise, and attain an appropriate level of fitness. All activity classes are for credit and are open to women and men. Students should consult the online Schedule of Classes for specific information regarding each semester’s offerings.

Scientific Diving. The Division of Diving Safety ensures that all underwater diving conducted under the auspices of UC Berkeley is done in accordance with the standards and policies established by the American Academy of Underwater Sciences and the Berkeley campus. The program is administered by the diving safety officer, in association with the Chancellor for Research, Environmental Health and Safety, the Physical Education Program, the College of Natural Resources, and the Richard Gump South Pacific Biological Research Station. A University Scientific Diver Permit is required for anyone diving for science using University equipment, diving from University-owned property, or diving as a student or employee of the University. The Diving Safety Program provides
opportunities for students, faculty, and staff to pursue SCUBA certification or a Scientific Diver Permit. There are fees associated with these services. Additional information can be found at pe.berkeley.edu/scubadiving

**Locker Room Regulations and Penalties.** A fine is imposed if students fail to comply with the following regulations: (a) clear locker by the specified date; (b) return equipment or clothing on or before the date posted for such return at the end of each semester; (c) overnight use of locker in designated areas.

**Fees.** A course material fee is assessed from every student enrolled in a physical education activity class. The fees are listed by class in the online Schedule of Classes.

### Lower Division Courses

1. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the elementary level. Students select activity by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

2. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the low-intermediate level. Students select activity by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

3. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the intermediate level. Students select activity by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

4. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the high-intermediate level. Students select activity by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

5. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Instruction in a variety of sports, exercise, and conditioning activities is offered at the advanced level. Students select activity by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Staff

6. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Formerly 6. Variety of intercollegiate sports for men. Students should select section by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Scott

7. **Physical Education Activities.** (.5) Course may be repeated for credit. Two hours of laboratory per week. Formerly 7. Variety of intercollegiate sports for women. Students should select section by interest and time preferences. Students should consult the online Schedule of Classes each semester to determine the particular activities available. (F,SP) Scott

8. **Fitness for Life: Physical Adaptations to Exercise.** (2) One and one-half hours of lecture and two hours of laboratory per week. Prerequisites: Limited to freshmen. Course develops the relationship between physical fitness and wellness through scientific evidence presented in the areas of exercise physiology and health. The body's adaptation to programs of aerobic conditioning and strength training are examined. Areas associated with health and fitness, including nutrition and weight control, maintaining fitness with age, heart disease, low back care, and stress reduction are discussed. The laboratory component emphasizes the development of a student's own fitness and health. (F,SP) Johannes

9. **Introduction to Skin and SCUBA Diving.** (2) Two hours of lecture and two hours of laboratory per week. Prerequisites: Pass swim evaluation and medical examination for diving. This course will prepare students to explore the marine environment. Lecture topics will include diving physics and physiology, life support equipment, the marine environment, diving safety and planning, and dive rescue techniques. Students will be introduced to the skills needed to maximize safety and enjoyment for recreational diving. Practice dives will be completed in both pool sessions and several open water ocean dives. Upon completion of the course, students will be able to demonstrate proper techniques in skin diving, SCUBA equipment handling, emergency response, neutral buoyancy, navigation, buddy diving techniques, and rescue skills. (F,SP) Hay ward, Scott

10. **Intermediate Skin and SCUBA Diving.** (2) Two hours of lecture and two hours of laboratory per week. Prerequisites: Basic SCUBA certification; pass swim evaluation and medical examination for SCUBA. This course is designed to continue the training and experiences of divers possessing a Basic Open Water certificate. Divers will be introduced to new diving environments and conditions other than those of night diving, nitrox diving, deeper diving, hazardous marine life, additional search and rescue techniques, etc. The weekend open water ocean dives will be conducted in Monterey and Carmel. This course will properly prepare students interested in underwater marine research and participation in PE/IB C407. Introduc- tion to Scientific Diving. Students who successfully complete all the course requirements will receive Advanced Diver and Enriched Air Nitrox Diver certifications from the National Association of Underwater Instructors (NAUI). (F) Hayward, Scott

11. **Water Safety Instructor Training.** (2) Two hours of lecture and two hours of laboratory per week. Prerequisites: 3 (Aquatics) or equivalent; preliminary skills test. The objective of this course is to provide students with the knowledge and skills needed to teach swimming and water safety classes in accordance with standards established by the American National Red Cross. A variety of methodologies will be used to carry out this objective. These include lectures, discussions, readings, audio-visual presentations and analyses of pool technique and practice sessions. Students will study the mechanics of various swimming strokes and life-saving techniques, learn the proper methods and progressions of teaching individuals of all ages and abilities, and examine methods for evaluating and improving an individual's performance. Upon successful completion of the course and the additional requirements of the American Red Cross, an appropriate certificate may be issued. (SP) Sterke

12. **Cultural Sources of Dance, Rhythm, and Movement.** (3) Two hours of lecture and two hours of laboratory per week. This course examines the many roles that dance plays in various cultures around the world. Students will explore dance with respect to folklore, religion, social, sports, leisure, history, and politics. Dances for birth, death, marriage, war, harvest, religion, and pleasure will be dissected, discussed, and related back to society. The course material will also bring focus to ideas pertaining to American culture and the use of the body in art and contemporary society. Biweekly lectures will identify how and why humans dance, and why certain rhythms and movements are cultural. In conjunction with lectures will be two-hour laboratory where students will personally experience movement styles, rhythms, and sounds of the world. No prior dance experience needed. (SP) L-Jue

13. **Cultural, Historical, Philosophical, and Social Foundations of Aesthetic Arts.** (2) Two hours of lecture per week. This course is designed for students to learn historical and cultural contexts in which various martial arts have emerged; how they have been influenced by historical, philosophical, cultural, social, political, and educational developments; what functions they once performed; and the place they hold in contemporary societies. Recent research will be studied regarding the physiological and psychological dimensions of martial arts and their contribution to physical and mental health. An essential component of such martial arts as Judo and Taekwondo is the development of strong moral and ethical values. Students will study why and how these are developed and how to be able to use this information in bettering their own lives. (SP) Ahn, Min

14. **Supervised Group Study.** (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Restricted to freshmen and sopho- mores with consent of instructor. Supervised studies by lower division students. Enrollment is restricted by regulations listed in this catalog. (F,SP) Staff

### Upper Division Courses

129. **Human Physiological Assessment.** (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Integrative Biology 123A, 123AL (may be taken concurrently). Principles and theories of human physiological assessment in relation to physical activity and conditioning. Performance of laboratory procedures in the measurement and interpretation of physiological fitness (cardiorespiratory endurance, body composition, musculoskeletal fitness). Also listed as Integrative Biology C129L. (F,SP) Johannes

165. **Introduction to the Biomechanical Analysis of Human Movement.** (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: 9 and Integrative Biology 131 and 131L. Basic biomechanical and anatomical concepts of human movement and their application to fundamental movement patterns, exercise, and sport skills. Also listed as Integrative Biology C125L. (F) Scott

197. **Field Study in Physical Education.** (1-3) Course may be repeated for credit. Individual conferences to be arranged. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of physical education, sport, and fitness. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. **Supervised Group Study.** (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Must have 60 units and consent of instructor. Supervised studies by upper division students. Enrollment is restricted by regulations listed in this catalog. (F,SP) Staff

### Professional Courses

C407. **Introduction to Scientific Diving.** (3) Two hours of lecture and three hours of laboratory per week. Prerequisites: Advanced scuba certification, swim test, medical exam, and consent of instructor. Diving physics, physiology, medicine, rescue, decompression, theory, navigation, environment, marine life, research methods, equipment, and University regulations. Course leads to University certification to use underwater life support apparatus for study or research under University auspices. Also listed as Integrative Biology C407. (SP) Staff
Field Major in Physical Sciences

Note: The Physical Sciences Field Major has been approved for discontinuance. No new students will be admitted to the major after spring 2011. All students in the major are expected to graduate no later than spring 2013.

This program has been developed for students who wish to concentrate on the physical sciences on a broader basis than is possible in a departmental major. Two plans are offered within the major:

1. Plan A is based on Physics 8, which is required of life sciences students, and Mathematics 16, which is required in part by life sciences departments. Through this plan, a student preparing for a career in environmental or health science can major in physical science and at the same time acquire the necessary pre-professional preparation. The plan, A, together with organic chemistry and a year of biology, will meet the entrance requirements of most medical schools.

2. Plan B is based on Physics 7 and Mathematics 1, which are required by physical science and engineering departments. Within this plan, it is possible to complete much of the departmental major in, for example, physics or chemistry, while also studying astronomy and geology as well as computer science.

For more information about the major and department, visit physics.berkeley.edu.

Plan A

( Broad introduction to physical science)

Lower Division. Mathematics 1A-1B, 6A-6B, 55; Physics 8A-8B; Chemistry 1A-1B; Computer Science 3.

Upper Division. Physics 132; two of the following courses: Chemistry 100, C130, 130B, 143, C182, or C150; Vision Science 203A (formerly Vision Science 101); Statistics 131A; Electives in physical sciences, mathematics, and statistics with the approval of the adviser to complete a total of 30 upper-division units in the major. Up to 8 upper-division units in engineering and/or computer science will be accepted with the approval of the major adviser.

Plan B

(Option of departmental concentration)

Lower Division. Mathematics 1A-1B, 53, 54; Physics 7A-7B-7C; Chemistry 1A-1B or 4A-4B. One of the following: EPS 50, 100A; Astronomy 7A, 7B, 1C-1B.

Upper Division. Two of the three courses Physics 105, 110A, or 137A; Chemistry 120A or (for students well-enough prepared) 104A. Electives in physical sciences, mathematics, and statistics with the approval of the adviser to complete a total of 24 upper-division units. Up to 8 upper-division units in engineering and/or computer science will be accepted with approval of the major adviser.

Honors Program

Students with a GPA both overall and in the major of at least 3.3 may wish to participate in the Honors Program leading to graduation with honors. The Honors Program includes two semesters of work in the department’s Honors Program with a senior thesis.
Upper Division. Physics 7A-7B-7C (regular or honors) and differential and integral calculus are prerequisite to all upper division courses except 
Physics 132. Upper division courses may schedule one more additional hour to the three hours of lecture. See the online Schedule of Classes. Physics 105, 110A, 112, 137A-137B; 6 units of 111; one additional course from the following list chosen with the approval of the major adviser: 110B, 129, 130, 138, 139, 141A-141B, 142, 151, 161 (cross-listed with astronomy), 177, 191. These options will give the student an extended introduction to some areas of research. Physics 110B is strongly recommended for students who plan to continue to graduate school.

Special programs may be worked out in consultation with the adviser. Completion of a physics major program is usually required for admission to graduate work. Additional mathematics from among the courses Mathematics 104, 121A-121B, 185 is recommended. Competence in the use of computers is desirable.

Honors Program. Students with an overall GPA of 3.3 or higher in courses in the major may be admitted to the Honors Program. A major adviser should be consulted before the student’s last year of residence. This program requires completion of the major, at least one year of Physics H190, and a senior thesis, H195A-H195B.

Biophysics. Students who wish to obtain a broad introduction to the biological sciences and their application to biology are referred to the Department of Molecular and Cell Biology. Here is no biophysics undergraduate degree major program.

Engineering Physics. The College of Engineering, with the cooperation of the Department of Physics and the Department of Molecular and Cell Biology, offers a B.S. in Biophysics. (The engineering physics major is open only to students registered in the College of Engineering.)

Field Major in Physical Science. Students interested in this major should see the Physical Science section of this catalog for a description of the major program.

The Minor

The Department of Physics has adopted a physics minor program. Students in the College of Letters and Science may obtain one or more minors of their choice, normally in a field both academically and administratively distinct from their major. The minor will conform to the College of Letters and Sciences regulations and will consist of the following coursework.

Prerequisites. Physics 7A, 7B, 7C (or their equivalent); Math 1A, 1B, 53, 54 (or their equivalent). These courses must be taken for a letter grade. Physics 7A-7B-7C must each be passed with a letter grade of C or better. Students must achieve a minimum GPA of 2.0 in the seven courses.

Minor Requirements. Physics 137A; 110A or 105. Three additional upper-division physics courses to total at least 9 units for an upper-division physics unit total at least 17 units. The following upper-division courses will not count for the minor program: Physics 100, 132, H190, H195A-H195B, 198, or 199. All upper-division physics courses must be taken for a letter grade. A minimum of three upper-division courses must be completed at Berkeley. An overall minimum GPA of 2.0 is required in upper-division courses applied to the minor program.

Students who have completed the requirements for the minor will be required to furnish transcripts (official or unofficial) to the undergraduate adviser (in 368 Le Conte Hall) to show their work and GPA in physics and math. After completing a Confirmation of Minor form (available in 368 Le Conte Hall), the students will be directed to a faculty major adviser who will approve the completion of the minor program.

Students may petition for a minor in physics from the time that the requirements are complete until the student graduates from the College of Letters and Sciences.

For more information regarding this program, contact the undergraduate student affairs officer in 368 Le Conte Hall.

Graduate Programs

Graduate work leading to the M.A. and Ph.D. degrees is offered in the Department of Physics with emphasis placed on the Ph.D. Note: The department will not consider applications from students who intend to work toward the M.A. degree only. In addition to applications and transcripts of undergraduate work, applicants must submit scores of the General and Physics Graduate Record Examinations, and, if applicable, the TOEFL. For detailed information concerning the physics graduate program, including admissions, visit physics.berkeley.edu (click on “Graduate”), or contact Physics Graduate Student Services at (510) 642-6626.

Research is a major part of the Ph.D. program, and the department offers opportunities in a wide variety of experimental and theoretical fields. Campus research includes atomic physics and spectroscopy, astrophysics, biophysics, condensed-matter physics, and theoretical and statistical mechanics. At the Lawrence Berkeley National Laboratory, extensive opportunities exist for research in astrophysics, elementary particle and nuclear physics, condensed-matter physics and materials science, and plasma and nuclear physics. Space physics, interplanetary studies, solar plasma research, physics of the upper atmosphere, and cosmological problems are pursued both in the Department of Physics and at the Space Sciences Laboratory.

Course requirements for the Ph.D. include the following: Physics 209, Classical Electromagnetism; 211, Equilibrium Statistical Physics; and 221A-221B, Quantum Mechanics; plus 19 units (five semester courses), approved upper-division or graduate elective courses (excluding any upper-division courses required for the undergraduate major)—at least 11 units must be in the 200 series. Some of the 19 elective units could include courses in mathematics, biophysics, or astrophysics. Consult departmental personnel for recommendations. Physics 251, 290, 295, 299, 300, and 602 are excluded from the 19 elective units. Physics 209, 211, and 221A-221B must be completed for letter grades (minimum grade B-). No more than the first-third of the 19 elective units may be fulfilled by courses graded satisfactory, and then only with approval from the department.

The master’s degree is administered according to regulations given in the Graduate Division section of this catalog. The Department of Physics requires a comprehensive examination rather than a thesis; passing the preliminary exams constitutes passing the comprehensive exam. The candidate must complete a comprehensive written examination and graduate work in physics (or related fields) with an average grade of at least a B. Eighteen of these units must be graduate courses in physics. Neither the comprehensive examination nor the student's upper-division (undergraduate) major requirements nor Physics 251, 290, 295, 299, 300, or 602 may be used to satisfy the 35-unit requirement. No more than 5 units of the master’s program may be fulfilled by courses graded satisfactory, and then only if approved by the department. M.A. petitions are due the fifth week of fall and spring semesters.

Lower Division Courses

Courses 7A-7B-7C or H7A-H7B-H7C are fundamental and are designed to meet the needs of students majoring in any of the physical sciences or who are enrolled in the College of Chemistry or the College of Engineering. Students proceeding with a second-year mathematics sequence should take courses 53-54 concurrently with Physics 7B-7C, respectively. Physics 8A-8B is required for pre-medical students, particularly those intending to pursue graduate work in architecture, and students in the biological sciences. Physics 10 is recommended for the non-science major who wishes to gain some understanding of basic physics. These courses fulfill, in part, the natural science requirements of the College of Letters and Science.

7A. Physics for Scientists and Engineers. (4)
Three hours of lecture and four hours of laboratory/workshop per week. Prerequisites: High school physics; Math 1A-1B or 53 (may be taken concurrently). Heat, electricity, and magnetism. (F,SP) Staff

7B. Physics for Scientists and Engineers. (4)
Three hours of lecture and four hours of laboratory/workshop per week. Prerequisites: 7A, Math 1A-1B, Math 53 (may be taken concurrently). Heat, electricity, and magnetism. (F,SP) Staff

7C. Physics for Scientists and Engineers. (4)
Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: 7A-7B, Math 1A-1B or 53-54 (may be taken concurrently). Electromagnetic waves, optics, relativity, and quantum physics. (F,SP) Staff

H7A-H7C. Physics for Scientists and Engineers. (4,4,4)
Students will receive no credit for H7A after taking 7A. Three hours of lecture, one hour of discussion, and three hours of laboratory per week. Prerequisites: High school physics; Math 1A or 1AS; Math 1B or 1BS (may be taken concurrently); Math 53; Math 54. Honors sequence corresponding to 7A-7B-7C but with a greater emphasis on theory as opposed to problem solving. Recommended for those students who have had advanced physics on the high school level and who are intending to declare a major in physics. Entrance into H7A is decided on the basis of performance on an examination given during the first week of class or the consent of the instructor, and into H7B-H7C on performance in previous courses in a standard sequence. (F,SP) Staff

8A. Introductory Physics. (4)
Students with credit for 7A will not receive credit for 8A. Three hours of lecture and four hours of discussion/laboratory per week. Prerequisites: Mathematics 16A or equivalent or consent of instructor. Introduction to forces, kinematics, equilibria, waves, and electricity. This course covers concepts and methodologies for understanding physical phenomena, and is particularly useful preparation for upper division study in biology and architecture. (F,SP) Staff

8B. Introductory Physics. (4)
Students with credit for 7B or 7C will not receive credit for Physics 8B. Three hours of lecture and four hours of discussion/laboratory section per week. Prerequisites: Mathematics 16A or equivalent. Introduction to electricity, magnetism, electromagnetic waves, optics, and atomic physics. This course presents concepts and methodologies for understanding physical phenomena, and is particularly useful preparation for upper division study in biology and architecture. (F,SP) Staff

C10. Descriptive Introduction to Physics. (3)
Students will receive no credit for C10 after taking 10. Three hours of lecture and one hour of discussion per week. Prerequisites: Open to students with or without high school physics. The course covers important topics in physics, stressing conceptual understanding rather than math, with applications to current events. Topics covered may vary and may include energy and conservation, radioactivity, nuclear physics, the Theory of Relativity, lasers, explosions, earthquakes, superconductors, and quantum physics. Also listed as Letters and Science C70V. (F,SP) Staff
rigid body dynamics, tensor analysis techniques. (F,SP) Staff
110A-110B. Electromagnetism and Optics. (4-4)
Three hours of lecture and one hour of discussion per week. A course emphasizing electromagnetic theory and applications; charges and currents; electric and magnetic fields; dielectric, conducting, and magnetic media; relativity, Maxwell equations. Wave propagation in media, radiation and scattering, Fourier optics, interference and diffraction, ray optics and applications. (F,SP) Staff

111. Modern Physics and Advanced Electrical Laboratory. (1-3)
Course may be repeated for credit. Nine units of lecture and one hour of discussion per week. Basic concepts of statistical mechanics, microscopic basis of thermodynamics and applications to macroscopic systems, condensed states, phase transitions, quantum distributions, elementary kinetic theory of transport processes, fluctuation phenomena. (F,SP) Staff

129. Particle Physics. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: 137A, 137B, or consent of instructor. Formerly 129A. Tools of particle and nuclear physics. Properties, classification, and interaction of particles including the quark-gluon constituents of hadrons, the major constituents of atoms analyzed by quantum mechanical methods. Course will survey the field including some related topics in nuclear physics. (F) Staff

130. Quantum and Nonlinear Optics. (3)
Three hours of lecture and one hour of discussion per week. Prerequisites: Restricted to graduate students only. (F,SP) Staff

132. Contemporary Physics. (3)
Not open for credit to students who have completed 133A. Three hours of lecture and one hour of discussion per week. Prerequisites: 131, 137A-137B, or consent of instructor. Detailed theory and experimental basis of quantum and nonlinear optics, exhibiting concepts of quantum measurement, noise, stochastic processes and applications. (F,SP) Staff

137A-137B. Solid State Physics. (4;3)
Prerequisites: 134A-134B. Detailed study of the electronic and magnetic properties of solids; energy bands and particle waves in periodic lattices; thermal magnetism and superconductivity; superconductivity; magnetic and dielectric properties of solids; energy bands of metals and semi-conductors; superconductivity; magnetism; ferroelectricity; magnetic resonances. (F,SP) Staff

141A-141B. Solid State Physics. (4.3)
Three hours of lecture and one hour of discussion per week. Prerequisites: 105, 110A-110B (110B may be taken concurrently). Motion of charged particles in electric and magnetic fields, dynamics of fully ionized plasma from both microscopic and macroscopic point of view, magnetohydrodynamics, small amplitude waves; examples from astrophysics, space sciences, and controlled-fusion research. (SP) Staff

151. Elective Physics: Special Topics. (3)
Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. Topics vary from semester to semester. The subject matter level and prerequisites for the course may vary from semester to semester. The subject matter level and prerequisites for the course may vary from semester to semester. (F,SP) Staff

C161. Relativistic Astrophysics and Cosmology. (4)
Three hours of lecture and one hour of discussion per week. Prerequisites: 112 or consent of instructor. This course may be repeated for credit currently. One and one-half to four hours afternoon lab sessions, and a one and one-half hour weekly lecture. In the second semester, Advanced Lab (3 units), students complete four of 20+ advanced experiments. These include many in atomic, nuclear, classical, and solid-state physics, among others. Students may, with approval, enroll in an optional third semester for variable units. (F,SP) Staff

177. Principles of Molecular Biophysics. (3)
Three hours of lecture and one hour of discussion per week. Prerequisites: 112 or consent of instructor. We will review the structure of proteins, nucleic acids, carbonyl, hydrocarbons, proteins, and the forces and interactions maintaining their structure in solution. We will discuss the thermodynamics and kinetics of protein folding. The principles of protein polymer chains and of helix-coil transitions in biopolymers will be reviewed next, together with biopolymer dynamics. We will then cover the main structural methods in biology: X-ray crystallography, NMR and fluorescence spectroscopy, electron and neutron microscopy, and single molecular methods. (SP) Staff

H190. Physics Honors Course. (2)
Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. A general descriptive course of selected topics in contemporary physics. Subject matter will vary and may include topics from special and general relativity, quantum mechanics, field theory, and particle physics. (F,SP) Staff

C191. Quantum Information Science and Technology. (3)
Three hours of lecture and one hour of discussion per week. Prerequisites: Mathematics 54, Physics 7A-7B, and either Physics 7C, Mathematics 55, or Computer Science 170. This multidisciplinary course provides an introduction to fundamental conceptual aspects of

Professor of the Graduate School
Recipient of Distinguished Teaching Award
quantum mechanics from a computational and information theoretic perspective, as well as physical implementations and technological applications of quantum information science. Basic sections of quantum algorithms, complexity, and cryptography will be touched upon, as well as pertinent physical realizations from nanoscale science and engineering. Also listed as Computer Science C219. (F,SP) Crommie, Vazirani, Whaley

H15SA-H15SB. Senior Honors Thesis Research. (2,2) Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to students in the honors program. Thesis work under the supervision of a faculty member. To obtain credit the student, at the end of two semesters, must include a satisfactory thesis. A total of 4 units must be taken. The units may be distributed between one or two semesters in any way. (F,SP) Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a pass/credit basis. Enrollment restrictions apply; see the Introduction to Courses and Curricula section in this catalog. (F,SP) Staff

199. Supervised Independent Study. (1-3) Must be taken on a pass/credit basis. Enrollment restrictions apply; see the Introduction to Courses and Curricula section in this catalog. (F,SP) Staff

Graduate Courses

C201. Introduction to Nanoscience and Engineering. (3) Three hours of lecture per week. Prerequisites: Major in physical science such as chemistry, physics, etc., or engineering; consent of advisor or instructor. A three-hour introduction to the fundamental topics of Nanoscience and Engineering (NSE) theory and research within chemistry, physics, biology, and engineering. This course includes quantum and solid-state physics, chemical synthesis, growth fabrication, and characterization techniques; structures and properties of semiconductors, polymer, and biomedical materials on nanoscale; and devices based on nanotechnology. Students must take this course to satisfy the NSE Designated Emphasis core requirement. Also listed as Bioengineering C280, Materials Science and Engineering C261, and Nanoscience and Engineering C201. (F,SP) Gronsky, S.W. Lee, Wu

C203. Computational Nanoscience. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Graduate standing or consent of instructor. A multidisciplinary overview of computational nanoscience and experimentalists. This course teaches the main ideas behind different simulation methods; how to decompose a problem into “simulatable” constituents; how to simulate the same thing two different ways; knowing what you are doing is more important than the importance of talking to experimentalists; what to do with your data and how to judge its validity; why multiscale modeling is both important and nonsense. Also listed as Nanoscale Science and Engineering C242. (F,SP) Staff

205A. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 105 or equivalent. Lagrange and Hamiltonian dynamics, stability, symmetries, integrals, and chaotic elements. Emphasis on recent developments, including turbulence. (SP) Staff

205B. Advanced Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 205A. Chemical systems, dissipative systems. Attractors. Emphasis on recent developments, including turbulence. (SP) Staff

209. Classical Electromagnetism. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 110A-110B or consent of instructor. Maxwell’s equations and their solutions and transformations, perturbation theory, nonlinear dynamics, KAM theory. (F) Staff

210. Quantum Electrodynamics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 211A. Perturbation theory, Green’s functions. Rigorous kinetic theory. (SP) Staff

211. Equilibrium Statistical Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 112 or equivalent. Foundations of statistical physics. Ensemble theory. Degenerate systems. Systems of interacting particles. (F) Staff


216. Special Topics in Many-Body Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent recommended. Quantum theory of many-particle systems. Applications of theory and technique to physical systems. Pairing phenomena, superfluidity, equation of state, critical phenomena, phase transitions, nuclear matter. (SP)

218. Quantum Mechanics. (5) Three hours of lecture and one hour of discussion per week. Prerequisites: 137A-137B or equivalent. Quantum theory of measurement; matrix mechanics; Schroedinger theory; symmetry and invariance principles; theory of angular momentum; quantum information; nonlocal principles; time independent perturbation theory; time dependent perturbation theory; theory of scattering. (F,SP) Staff

221. Quantum Mechanics. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A or equivalent. Introduction to particle physics phenomena. Emphasis is placed on experimental tests of particle physics models. Topics include Quark model spectroscopy; weak decays; overview of detectors and accelerators; e+e- annihilation; partron model; electron-proton and neutron-proton scattering; special topics of current interest. (F) Staff

222. Extragalactic Astronomy and Cosmology. (3) Three hours of lecture per week. A survey of physical cosmology, stellar populations, and energetics of the Universe. Topics include the Friedmann-Robertson-Walker model, thermal history and big bang nucleosynthesis, evidence and nature of dark matter and dark energy, theories of galaxy formation and large scale structure, the anisotropy of the cosmic microwave radiation, inflation in the early Universe, tests of cosmological models, and current research areas. The course components the material of Astronomy 218. Also listed as Astronomy C222. (F,SP) Staff

231. General Relativity. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 209 or equivalent, or consent of instructor. An introduction to Einstein’s theory of gravitation. Tensor analysis, differential geometry, the Einstein field equations. Applications, for example, to the solar system, dense stars, black holes, and cosmology. (SP) Staff

232A. Quantum Field Theory I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 221A-221B or equivalent or consent of instructor. Prerequisites: Open only to students in the standard model and beyond: open problems in the standard model; supersymmetric models; grand unification; neutrino physics; theories with flat and warped extra dimensions; models at the TeV scale; low string/gravity scale. Selected current topics. (SP)

233A. Standard Model and Beyond I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 232A or equivalent or consent of instructor. Introductions to the standard model of particle physics and its applications; construction of the standard model; Higgs mechanism; phenomenology of weak interactions; chiral Lagrangian; QCD and scattering. (SP)

233B. Standard Model and Beyond II. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture and one hour of discussion per week. Prerequisites: 233A or equivalent or consent of instructor. Advanced topics in the standard model and beyond: open problems in the standard model; supersymmetric models; grand unification; neutrino physics; theories with flat and warped extra dimensions; models at the TeV scale; low string/gravity scale. Selected current topics. (F)

234A. String Theory I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 232A or equivalent or consent of instructor. 232B is recommended. Perturbative theory of the bosonic strings, supersymmetry, and heterotic strings. Topics include black holes; black branes; Bekenstein-Hawking entropy; D-branes; string dualities; M-theory; holographic principle and its realizations; AdS/CFT correspondence; gauge theory/gravity dualities; flux compactifications; cosmology in string theory; topological string theories. Selected current topics. (SP)

238. Advanced Atomic, Molecular, and Optical Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 110A, 130, 137A-137B, and 138; or consent of instructor. Contemporary topics in atom, molecular, and optical physics are presented at an advanced level. These topics may include one or several of the following, at the discretion of the instructor: mechanical effects of light on atoms and molecules, ultra-cold atomic physics, molecular physics, resonance optics of multi-level atoms, and probing particle physics with atoms and molecules. (F,SP) Staff

240A-240B. Quantum Theory of Solids. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 141A-141B and 221A-221B or equivalents, or consent of instructor. 240A is prerequisite to 240B. Excitations and interactions in solids; crystal structures, symmetries, Bloch’s theorem; energy bands; electron dynamics; impurity states; lattice dynamics, phonons; many-electron interactions; density functional theory; dielectric functions, conductivity and optical properties; excitons; electron-phonon interaction; superconductors; Fermi surface, Fermi liquid, and Coulomb blockade; Quantum Hall effect; transport processes, Boltzmann equation; superconductivity, BCS theory; many-body perturbation theory, Green’s functions. (F) Staff

242A-242B. Theoretical Plasma Physics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 142. Advanced Dynamics. Nonequilibrium plasma behavior according to the Vlasov, Fokker-Planck equations, guiding center and hydromagnetic descriptions. Study of equilibria, stability, and nonlinear electromagnetic waves, transport, and interaction with radiation. Rigorous kinetic theory. Staff

250. Special Topics in Physics. (2-4) Course may be repeated for credit with consent of instructor. Prerequisites: Consent of instructor. Topics will vary from
Plant and Microbial Biology

(College of Natural Resources)

Department Office: 111 Koshland Hall, (510) 642-9999
Student Affairs Office: 102 Koshland Hall, (510) 642-1896

nature.berkeley.edu/site/ plant-micro_bio.php

Chair: Brian Staskawicz, Ph.D.
Division Chair, Plant Biology: Brian Staskawicz, Ph.D.
Division Chair, Microbial Biology: Thomas Bruns, Ph.D.

Professors
Steven E. Brenner, Ph.D. University of Cambridge, Cambridge, UK. Structural computational and functional genomics
W. Zeches Zufall, Ph.D. Stanford University. Cell and developmental biology
John Coates, Ph.D. University of California Galway. Geomicrobiology, bacterial diversity, microbiology and geochemistry
Lewis J. Feldman, Ph.D. Harvard University. Plant phylogeny/development
Robert Freeling, Ph.D. University of California, Berkeley. Plant genetics and molecular biology
Michael Freeling, Ph.D. University of California, Berkeley. Plant development and gene regulation
N. Louise Glass, Ph.D. University of California, Davis. Fungal genetics
Andrew G. Jackson, Ph.D. University of Manitoba, Canada. Plant virology
Russell L. Jones, Ph.D. University of Wales. Plant physiology
Steven E. Lindow, Ph.D. University of Wisconsin. Bacterial genetics, plant pathology, and epidemiology
Sheng Luan, Ph.D. Harvard University. Plant cell biology
Annastasia Melis, Ph.D. Florida State University. Biochemistry and biotechnology
Krishna K. Niyogi, Ph.D. Massachusetts Institute of Technology. Plant biochemistry
Peter H. Quail, Ph.D. University of Sydney. Plant molecular biology
Chris Somerville, Ph.D. University of Alberta. Plant genetics
Shauna Somerville, Ph.D. University of Illinois, Urbana-Champaign. Plant physiology
Brian J. Staskawicz, Ph.D. University of California, Berkeley. Molecular plant pathology
Tim Zaremba, Ph.D. University of California, Berkeley. Plant cell biology
John W. Taylor, Ph.D. University of California, Davis. Evolution of fungi
Norman Terry, Ph.D. Nottingham University. Environmental plant physiology
Patricia C. Zambrzycki, Ph.D. University of Colorado. Plant molecular biology
Sydney Kustu (Emeritus), Ph.D. Watson M. Lasker, Ph.D. Paul Ludden (Emeritus), Ph.D. Richard Makin (Emeritus), Ph.D. Rodene B. Park (Emeritus), Ph.D. Loy Volkman (Emeritus), Ph.D. John A. West (Emeritus)

Associate Professors
Markus Pauly, Ph.D. Technical University, Aachen, Germany. Plant cell wall polysaccharide structure and function
Kathleen Ryan, Ph.D. John Hopkins University School of Medicine. Brain ion channels and signal transduction
Kimmen Spälander, Ph.D. University of California, Santa Cruz. Computational biology
Assistant Professors
Britt Grausnnger, Ph.D. Baylor College of Medicine. Herpes viruses
Arash Komeili, Ph.D. University of California, San Francisco. Bacterial cell biology
Chelsea Specht, Ph.D. New York University. Plant evolution and diversity
Michiko Taga, Ph.D. Princeton University. Symbiotic bacteria-host interactions
Mary Wilde, Ph.D. University of Colorado, Boulder. Biosynthesis regulation and functional genomics of small molecules that control soil-plant interactions
Daniel Zilberman, Ph.D. University of California, Los Angeles. Molecular cell, and development biology

Adjunct Professors
Sarah C. Hale, Ph.D. Washington University. Plant developmental genetics
Sheila M. McCracken, Ph.D. University of Missouri. Plant reproductive biology
Henrik Schielzeth, University of Copenhagen. Plant cell wall biosynthesis

Jennifer Baker, Ph.D. University of California, San Francisco. Genetics and development
Jay Holdik, Ph.D. University of Washington, Seattle. Epigenetics
Cheryl Kerfield, Ph.D. University of California, Los Angeles. Structural biology/genomics

Adjunct Assistant Professor
Frank Harmon, Ph.D. University of California, Davis. Plant molecular biology

Cooperative Extension Specialist
Peggy Lemieux, Ph.D. University of Michigan. Cereal genetic engineer, gene function and expression

Undergraduate Advisers: Prof. Kornei, Prof. Melis
Graduate Adviser: Prof. Zambrzycki

Department Overview

The Department of Plant and Microbial Biology consists of the Division of Plant Biology and the Division of Microbial Biology. Programs at both the undergraduate and graduate levels have been designed to offer students maximum flexibility in determining their own areas of interest. In addition to department resources that are available in Koshland Hall, the facilities of the College of Natural Resources Biological Imaging Facility and the U.S. Department of Agriculture Plant Gene Expression Center are available for the programs of the department.

The Division of Plant Biology. The Division of Plant Biology program emphasizes basic research and its application to plants and promotes the design of plant biotechnologies. With an increasing awareness of environmental problems, global changes, and emerging food needs, plants are a focal point for new research initiatives and educational training programs. Understanding the biology of plants, their development, their responses to stresses, and their ability to maintain a high quality of life for all eukaryotes. Moreover, understanding the microbial world is necessary if we are to comprehend the global ecosystem, evolution, and diversities of life on earth. The 21st century will bring a new understanding of the workings of the global ecosystem and a wealth of new technologies derived from the microbial world. The new microbial biology research programs are designed to meet this challenge.

Undergraduate Program in Genetics and Plant Biology

The Undergraduate Program in Genetics and Plant Biology has been developed as a broadly based program emphasizing the study of plants from the molecular and genetic to organismal levels. Lower division courses are intended to produce a foundation in biological and physical sciences as preparation for advanced study at the upper division level. Most of the department course offerings are accompanied by laboratory classes that focus further on the subject matter and introduce students to the latest techniques in genetics and plant biology. The department offers research opportunities in departmental research laboratories to qualified undergraduate students. These opportunities include the form of Honors Research (PMB H196) or Supervised Independent Study and Research (PMB 99 and PMB 199).

Department of Plant and Microbial Biology

The Department of Plant and Microbial Biology consists of the Division of Plant Biology and the Division of Microbial Biology. Programs at both the undergraduate and graduate levels have been designed to offer students maximum flexibility in determining their own areas of interest. In addition to department resources that are available in Koshland Hall, the facilities of the College of Natural Resources Biological Imaging Facility and the U.S. Department of Agriculture Plant Gene Expression Center are available for the programs of the department.

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Lower Division. Biology 1A, 1B; Chemistry 1A, 3A, 3AL, 3B, 3BL; Mathematics 16A, 16B; Physics 8A; approved statistics or computer course; 15 units of approved Humanities and Social Sciences electives; 8 units of Reading and Composition.

Upper Division. PMB 107/107L, 135/135L, 150/150L, 160/160L; and five approved science elective courses totaling 15 units.

For further details and requirements, visit nature.berkeley.edu.

Undergraduate Program in Microbial Biology

Microbial biology is a pivotal field of study because microbes are the dominant life form and represent the overwhelming majority of the biomass on the planet. Microbes have fundamental roles in maintaining the health of the biosphere: they degrade environmental pollutants; they supply essential nutrients and chemicals directly to multicellular organisms; and they engage in intimate symbiotic relationships with higher organisms. By the same token, infectious diseases regulate populations of plants and animals, and outbreaks recur in human societies on a global scale. Microorganisms are the evolutions of chloroplasts and mitochondria, the energy-producing centers of plants and animals, so even the study of evolutionary biology is not complete without an understanding of microbial biology.

Furthermore, the full diversity of the microbial world is poorly known, because many unique organisms and biochemical processes remain to be discovered. The renewed appreciation of the relevance of microbes to all life means that there is an increasing demand in government and industry for employees with knowledge and skills related to microbial biology. The microbial biology (MB) major is designed to interest students in competing for such positions, for pre-med and pre-vet students, for students interested in biology in general, and for students interested in pursuing post-graduate education in biology.

Lower Division. Biology 1A-1B; Chemistry 1A, 3A, 3AL, 3B, 3BL; Mathematics 16A/16B; and approved statistics courses; 15 units of approved Humanities and Social Sciences electives; 8 units of Reading and Composition.

Upper Division. MCB 102 or 110; PMB C112, C112L, C148; and six approved science elective courses totaling 15 units. For further details and requirements, visit nature.berkeley.edu.

Graduate Program in Microbial Biology

The Department of Plant and Microbial Biology administers the Graduate Group in Microbial Biology, which awards the Ph.D. degree in microbial biology at UC Berkeley. A graduate group is an interdepartmental group that involves at least five members of the department. The graduate group features an introductory seminar (Faculty Research Review), five- to six-week core course modules, and additional special-topic courses and seminars in areas of faculty specialties. The core course modules are microbial genetics, genomics and computational biology, microbial diversity and evolution, cell structure and function, microbial physiology, and molecular biology.

For more information on the Graduate Program in Microbial Biology, see the full description under Microbiology in this catalog.

Lower Division Courses

10. Plants, Agriculture, and Society. (2) Two hours of lecture per week. Changing patterns of agriculture in relation to population growth, the biology and social impact of plant disease, genetic engineering of plants, a thousand years of crop improvement and modern biotechnology, interactions between plants and the environment, and effects of human industrial and agricultural activity on plant ecosystems. Knowledge of the physical sciences is neither required nor assumed. (F) Staff

13. Genetic Revolutions. (3) Two hours of lecture and one hour of discussion per week. Genetic discoveries have changed our lives. All are controversial. From physical and mental health, agriculture, social systems, and worldviews. Having many DNA-sequenced genomes, including human, accelerates discovery. This course will study the science, history, and philosophical implications behind past discoveries and contemplate future genetic revolutions. (SP) Zambryski

24. Freshman Seminar. (1) One hour of discussion per week. Must be taken on a passed/not passed basis. Formerly 20. Reading and discussion with Plant and Microbial Biology faculty on current research and topics in plant and microbial biology. Topics which may be discussed include microbial biology, plant genetics, plant development, plant pathology, agricultural biotechnology, and biotechnology. Ideal for students who are considering a major in the Department of Plant and Microbial Biology. Enrollment is limited to 20 freshmen. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit. One hour of lecture per week. Prerequisites: Consent of instructor. (SP) Zambryski

40. The (Secret) Life of Plants. (3) Two hours of lecture and one hour of discussion per week. Covers contemporary topics in plant biology. Examines how plants (e.g., to light) in ways distinct from animals. Presents basic principles of genetics, cell, and molecular biology. Basics of genetic engineering and biotechnology reveal how they are used to modify plants, and these socially relevant issues are assessed. Includes visit to modern plant biology research laboratory, and aspects of plant disease and diversity. Knowledge of the physical sciences neither required nor assumed. (SP) Zambrayski

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week for 15 weeks. Three hours of seminar per week for 10 weeks. Three hours of seminar per week for 15 weeks. Three hours of seminar per week for 15 weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: Consent of instructor. Sophomore seminars are small, interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores. (F,SP)

C96. Studying the Biological Sciences. (2) Hours of lecture per week. Must be taken on a passed/not passed basis. Prerequisites: GPA of 3.0 or higher; lower division status. Lower division independent study and research intended for the academically superior student. Enrollment only with prior approval of faculty advisor directing the research. (F,SP) Staff

98. Directed Group Study. (1-3) Course may be repeated for credit. One to three hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Directed group study and seminar focusing on topics of interest, varying from semester to semester. Staff

99. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Individual meetings. Must be taken on a passed/not passed basis. Prerequisites: GPA of 3.4 or higher; lower division status. Lower division independent study and research intended for the academically superior student. Enrollment only with prior approval of faculty advisor directing the research. (F,SP) Staff

Upper Division Courses

C102. Diversity of Plants and Fungi. (2) Two hours of lecture per week. Must be taken concurrently with C102L. An integrated treatment of the biology and evolution of the major groups in the plant, algal, and fungal kingdoms. Also listed as Integrative Biology C101. Offered alternate years. (F) Staff

C102L. Laboratory in the Diversity of Plants and Fungi. (2) Four hours of laboratory per week and two 1-day field trips. Prerequisites: BIology 1A-1B. Must be taken concurrently with C102. Laboratory for C102. Also listed as Integrative Biology C101L. Offered alternate years. (F) Staff

C103. Bacterial Pathogenesis. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology C100A/Chemistry C130 or Molecular and Cell Biology C100B/Chemistry C130. Field trips or consent of instructor for upper division and graduate students will explore the molecular and cellular basis of microbial pathogenesis. The course will focus on modern microbial systems which illustrate mechanisms of pathogenesis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also

Graduate Program in Plant Biology

The graduate program in plant biology is designed to train students in modern research areas of plant biology. Students’ courses of study are designed individually, in light of their interests and career goals. The graduate program features an introductory seminar (Faculty Research Review), six- to eight-week core course modules, and additional special-topic courses and seminars in areas of faculty specialties. The department has research expertise in the following areas: molecular, cellular, genetic, biochemical, physiological, developmental, and structural biology and plant-microbe interactions. The core courses cover plant development, genetics, genomics and computational biology, plant diversity and evolution, plant cell biology, plant biochemistry, and plant systems biology.

Prospective students for the graduate program in plant biology are expected to demonstrate academic excellence and potential for independent scientific work. Applicants are expected to have a basic background in chemistry, physics, mathematics, and biology equivalent to those in the undergraduate program. An admissions committee composed of five members of the department will review applications and make recommendations to the full department on admissions matters. Recommendations for admission will be based on a demonstration of academic excellence and potential for independent scientific research as shown by grades in university-level undergraduate and graduate courses, letters of recommendation, written statements of purpose, potential, and other evidence of academic accomplishment. Scores on standardized tests such as the Graduate Record Examination (GRE) will be required of all applicants. Students seeking detailed information about matters such as admission, curriculum, and courses of financial support should contact the student affairs assistant or the graduate adviser.

Graduate Program in Microbiology

The Department of Plant and Microbial Biology administers the Graduate Group in Microbiology, which awards the Ph.D. degree in microbial biology at UC Berkeley. A graduate group is an interdepartmental group that involves at least five members of the department. The graduate group features an introductory seminar (Faculty Research Review), six- to eight-week core course modules, and additional special-topic courses and seminars in areas of faculty specialties. The core course modules are microbial genetics, genomics and computational biology, microbial diversity and evolution, cell structure and function, microbial physiology, and molecular biology.

For more information on the Graduate Program in Microbial Biology, see the full description under Microbiology in this catalog.
include some aspects of bacterial genetics and physi- 
ology, immune response to infection, and the cell 
biology of host-parasite interactions. Also listed as 
Public Health C103, Physiology and Biochemistry of Plants. (F)

C107. Principles of Plant Morphology. (3) Two 
hours of lecture and one hour of discussion per week. 
Prerequisites: Biology 1A-1B; must be taken concurrently 
with C107L. Formerly 100. An introduction to the 
structure and function of plants for upper division 
students to the principles and applications of modern 
plant biotechnology. Basic concepts of modern agri-
culture will be reviewed in light of emerging biotech-
ology applications. Emphasis will be placed on 
understanding the tools and strategies involved in 
optimizing plant productivity. (SP) Baker, Somerville

C144. Microbial Genomics and Genetics. (4) Three 
hours of lecture and one hour of discussion per week. 
Prerequisites: Biology 1A-1B. An integrated and 
multidisciplinary approach to the study 
of interactions between plants and the environment. 
Introduces physical parameters in the global 
and micro-environment that affect plant function; 
and molecular, cellular, and developmental aspects 
of plant response to suboptimal/adverse conditions. 
Current topics in molecular biology, physiology, and 
molecular biology of plant adaptation and acclimation mecha-
nisms. Examines consequences of industrial activity on 
plant growth and productivity. (SP) Melis, Terry

C148. Microbial Genomics and Genetics. (4) Three 
hours of lecture and one hour of discussion per week. 
Prerequisites: Molecular and Cell Biology C104A 
or C104B or C130 or Molecular and Cell Biology 102. 
Formerly Plant and Microbial Biology 118. Course 
focuses on microorganisms and their roles in 
biotechnology. Focuses on the molecular and cellular 
level, including genetic and biochemical analyses. 
Current topics include: molecular and cellular bases 
for the exceptional cellular and developmental strategies 
that underlie the success of microorganisms, both procaryote and 
eukaryote, using a phylogenetic framework to 
understand biodiversity. Emphasis will be placed on 
the exploration of the ecological significance of 
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ular and morphological data will be discussed and with a basic understanding of the tools and techniques used to study plant diversification and evolution. Molecular and morphological data will be discussed and with a basic understanding of the tools and techniques used to study plant diversification and evolution. Molecular and morphological data will be discussed and with a basic understanding of the tools and techniques used to study plant diversification and evolution.

Three hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The aim of this course is to highlight the specific hallmarks of systems biology. Students will be informed of the many resources for systems biology available to plant biologists and the recent published work that capitalize on these resources. Each lecture will focus on fundamental principles followed by discussion of papers that are germane to the topic. (F) Harmon

201. Faculty Research Review. (2) Three hours of lecture per week. Must be taken on a satisfactory/ unsatisfactory basis. Prerequisites: Consent of instructor. Presents a research project in the areas of plant and microbial biology. Faculty speakers review recent advances in their area of expertise and present an outlook of current research activities in their laboratories. The format of the class is designed to allow for interaction between instructor and students in the course of each presentation. (F) Staff

202. Faculty Research Review. (1) One hour of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Overview of faculty research project in the areas of plant and microbial biology. Faculty speakers review recent advances in their area of expertise and present an outlook of current research activities in their laboratories. The format of the class is designed to allow for interaction between instructor and students in the course of each presentation. (F) Staff

210. Scientific Reasoning and Logic. (1) One hour of lecture per week. The objectives of this class are to teach students to critically read and interpret scientific papers. Students will read and discuss critically and poorly reasoned papers. At the end of the class, the student should understand the logic and reasoning which make a paper a strong, often classic, contribution. (F) Quail

C216. Microbial Diversity Workshop. (1) One hour of workshop and one hour of discussion per week. Prerequisites: Graduate standing; C112 or consent of instructor and organic chemistry (may be taken concurrently). This workshop for graduate students will parallel C116, Microbial Diversity, which should be taken concurrently. Emphasis in the workshop will be on review of research literature and formulation of paper pertinent to research in microbial diversity. Also listed as Molecular and Cell Biology C216. (F) Coates

220. Critical Thinking in Microbiology. (3) One and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. This course will introduce students to the diversity of plant form and function and provide them with a basic understanding of the tools and techniques used to study plant diversification and evolution. Molecular and morphological data will be discussed and plant diversity will be introduced at molecular, population, organismal, and ecosystem levels. (F) Sjölander

220A. Plant Biochemistry. (1.5) Three hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The aim of this course is to highlight the specific hallmarks of systems biology. Students will be informed of the many resources for systems biology available to plant biologists and the recent published work that capitalize on these resources. Each lecture will focus on fundamental principles followed by discussion of papers that are germane to the topic. (F) Scheller

220F. Plant Systems Biology. (1.5) Three hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The aim of this course is to highlight the specific hallmarks of systems biology. Students will be informed of the many resources for systems biology available to plant biologists and the recent published work that capitalize on these resources. Each lecture will focus on fundamental principles followed by discussion of papers that are germane to the topic. (F) Harmon

220G. Plant and Microbial Biochemistry. (1.5) Three hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The aim of this course is to highlight the specific hallmarks of systems biology. Students will be informed of the many resources for systems biology available to plant biologists and the recent published work that capitalize on these resources. Each lecture will focus on fundamental principles followed by discussion of papers that are germane to the topic. (F) Scheller

220H. Plant and Microbial Biochemistry. (1.5) Three hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The aim of this course is to highlight the specific hallmarks of systems biology. Students will be informed of the many resources for systems biology available to plant biologists and the recent published work that capitalize on these resources. Each lecture will focus on fundamental principles followed by discussion of papers that are germane to the topic. (F) Scheller

220L. Protein Informatics Laboratory. (2) Six hours of lecture and one and one-half hours of discussion for five weeks. Prerequisites: Consent of instructor. The course may be repeated for credit. Must be taken concurrently, not repeatable for credit. No programming experience required. This course
Program in Political Economy

Political Economy (College of Letters and Science)

Group Major Office, International and Area Studies: 101 Stephens Hall, iastp.berkeley.edu, (510) 642-4466
Chair: J. Bradford DeLong
Faculty Advisers

Vinod Agarwala (Political Science)
Maximilian Auffhammer (International and Area Studies)
Richard M. Buxbaum (Economics and Statistics)
Stephen Cohen (City and Regional Planning)
Beverly Crawford (International and Area and Area Studies)
J. Bradford DeLong (Economics and Statistics)
Robert Kagan (Political Science)
Alan Karras (Information Studies)
Jonathan Leonard (Business Administration)
Joseph Lough (International and Area Studies)
Stephen Vogel (Political Science)
Steven Weber (Political Science)
John Zysman (Political Science)

Faculty

John Hassler, Early American Studies
John S. Ikenberry, International and Area Studies
Robert R. Kagan, International and Area Studies
Vinod Agarwala, Political and Legal Foundations
Jonathan Leonard, Business Administration
Alan Karras, Information Studies
J. Bradford DeLong, Business Administration

Courses

Course may be repeated for credit. One to two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Advanced study in various domains of political science is required. Topics will be announced in advance of each semester. Enrollment in more than one section permitted. (FSP) Staff

290. Seminar. (1-2) Course may be repeated for credit. One to two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Advanced study in various domains of political science is required. Topics will be announced in advance of each semester. Enrollment in more than one section permitted. (FSP) Staff

297. Grant Writing and Research Presentations. (2) Two hours of lecture per week. Each student will write a grant proposal in three steps: a one-page outline, a three-page pre-proposal, and a complete 10-page grant proposal. There will be feedback at each step in the process; each participant will review the others’ assignments. Some of the scheduled classes will include discussion of the outlines and pre-proposals, and the last class will be organized as a grant panel, with students assigned as primary and secondary writers. (FSP) Staff

298. Plant Biology Group Studies. (1-6) Course may be repeated for credit. One hour of lecture/discussion per week per unit. Sections 1-2 to be offered on a satisfactory/unsatisfactory basis. Section 3 to be offered on a satisfactory/unsatisfactory basis. Other sections will be offered at the discretion of the instructor. Prerequisites: Consent of instructor. Advanced study of research topics which will vary semester to semester. Enrollment in more than one section permitted. (FSP) Staff

299. Graduate Research. (1-12) Course may be repeated for credit. Three hours of research per credit hour per week per unit. Prerequisites: Graduate standing. Graduate student research. (FSP) Staff

602. Individual Study for Graduate Students. (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements for doctoral degree. One-half credit/half credit per week. (FSP) Staff

300. Workshop on Teaching. (2) Course may be repeated for a maximum of 4 units. Two hours of lecture/discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status. Designed for all graduate students. This course has two goals: (1) discussion of questions and problems relating to the GSI’s teaching and (2) learning how to design and execute a whole course. Effective teaching methods will be introduced by experienced GSIs and faculty. Students will participate in reciprocal classroom visits, visitation and critique of GSI faculty courses, design, lecture preparation, sample lecture presentation, and discussion of current literature on teaching. (FSP) Staff

Political Economy / 427
modern foreign language, other than English, equivalent to four college-level semesters.

Foreign Language Requirement. There are three ways that students can fulfill the four-semester language requirement for PE, depending on their background and ability:

(1) Through coursework. A combination of college, summer program, or college-level study abroad programs could satisfy the language requirement. At a minimum, students must complete the fourth semester of a language with a grade of C or better. The first, second, and third level of language may be taken on a passed/not passed basis; the fourth semester must be taken for a letter grade. Language courses need not be taken at Berkeley; courses taken at a community college or any accredited school or university are acceptable. Advanced Placement Language Test scores of 5 complete the requirement. However, transcripts and score reports must be provided. See an adviser in the IAS office concerning language study abroad.

(2) With a proficiency examination. Students whose language skills are at a fourth semester or beyond capability and who do not wish to take language courses can opt to test out of the requirement. However, not all of Berkeley’s language departments offer proficiency exams. See a PE adviser about specific department policies.

(3) Being a non-native English speaker. Non-native speakers of English may use their native language to satisfy this requirement; however, documentation of fourth-semester ability is still required. Students can take a proficiency test (see above) or, alternatively, provide documentation that they have been educated in their native language at least through high school or the equivalent.

Lower Division. There are three required courses at the lower division level. Lower division requirements may be satisfied by: (1) successfully completing the appropriate course or its equivalent; (2) providing evidence of AP credit; or (3) with prior consent from an IAS adviser, satisfactorily completing an upper division equivalent. Contact the IAS office for current information.

Required Courses. Economics 1 or 2 or CS 3; IAS 45; Statistics 2 or 20 or 21.

Upper Division. There are nine required upper division courses spread among three major divisions: conceptual tools, including intermediate economics (two courses) and theory (two courses); historical and theoretical underpinnings and different models of coping with these changes. Within the Post Industrial Political Economy track, students have the option of focusing their study on a specific world region (Europe, East Asia, South and Southeast Asia, or Latin America). The courses draw from many different departments in the social sciences, humanities, and the professional schools allowing PE students to choose from a broad base of methods and approaches.

The Political Economy of Late Industrialization and Development. Courses in this concentration focus on the relationship between more recent industrialization, globalization, and economic development. Central to this concentration is the relationship between the state and the economy in a variety of areas such as, but not limited to, agricultural improvement, environmental challenges, increasing populations, global poverty, public health, and resource allocation. Students can study the problems of development from a variety of disciplinary perspectives. Within the Political Economy of Late Industrialization and Development track, students also have the option of focusing their study on a specific world region (Europe, East Asia, South and Southeast Asia, or Latin America).

Globalization. In this concentration, students will be exposed to the historical roots of globalization as well as the economic, political, and cultural elements of the process. They will gain insight into the many debates associated with globalization, making them better prepared for global citizenship and careers that demand a thorough understanding of international issues. Within the Globalization track, students again have the option of focusing their study on a specific world region (Europe, East Asia, South and Southeast Asia, or Latin America). The courses draw from many different departments in the social sciences, humanities, and the professional schools allowing students to choose from a broad base of methods and approaches.

5. Developing a Self-Designed Concentration Topic:

Some students prefer to develop their own concentration topics and choose related coursework. To do so, students must submit a convincing two-paragraph description of their concentration topics. This must include a list of the four courses to be taken and an explanation of how those courses relate to, and support, the concentration topic. Some examples of independently constructed concentrations might be:

- dilemmas of medical care cost control and resource allocation around the globe
- religion and the state in early modern Europe
- the contemporary Middle East
- comparative industrialization in the early 19th and early 21st centuries
- how China’s current industrialization is and is not like Japan’s was. The possibilities for interesting and unique concentrations within PE are wide and varied, depending on a student’s interests and enthusiasm.

Minor in Political Economy

PE offers a minor in political economy that is open to all undergraduates except PE majors. Applications for the minor and a list of appropriate courses are available from the IAS office. Minor applications must be submitted no later than the last day of instruction of the semester immediately preceding the minor student’s final semester.

Requirements. Students must complete six upper division courses, including PE 100 and 101. The remaining four courses must be concentrated in two of three specified fields: politics, business/economics, and culture and society; they must be distributed evenly between the two chosen fields (i.e., two courses per field).

The following college requirements also apply: (1) at least three of the upper division courses must be taken at Berkeley; (2) all courses must be taken for a letter grade; (3) a minimum GPA of 2.0 must be achieved in all coursework used to satisfy the minor requirements; and (4) no more than one course can satisfy requirements for both a major and a minor.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit. Topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. (F,SP) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Student-directed course under the supervision of a faculty member. Subject matter to change from semester to semester. (F,SP)

100. Classical Theories of Political Economy. (4) Three hours of lecture and one hour of discussion per week. One-semester lecture course offered each semester. In-depth analysis of the classical political economy literature, including such authors as Locke, Smith, Marx, Mills, and Weber to Veblen and Polanyi. Strong emphasis is placed on providing appropriate background for understanding the evolution of the literature that has emanated from the various social science disciplines which forms the basis of modern political economy. (F,SP)
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101. Contemporary Theories of Political Economy. (4) Three hours of lecture per week. Prerequisites: 100 or consent of instructor. This course is designed to introduce students to modern theoretical works of central intellectual debates on 20th-century international political economy. The course explores alternative explanations for inequality in economic development among nations and economic consequences of the dominant powers. It will also examine tensions between the increasing “globalization” of that economy and continued fragmentation of the international political system in nation-states. (F,SP)

130. Cross-Listed Topics. (1-4) Course may be repeated for credit. Prerequisites: Consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to PE majors. Content and credit vary from course to course. (F,SP)

140. Special Topics. (2) Course may be repeated for credit. Three hours of lecture per week for eight weeks. Prerequisites: Consent of instructor. A short course designed to provide a vehicle to take advantage of short-term visitors coming to campus who have considerable expertise in areas of interest to political economy. Topics will vary from semester to semester. (F,SP)

150. Advanced Study in Political Economy of Industrial Societies. (4) Course may be repeated for credit. Prerequisites: Upper division standing and consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to PE majors. Content and credit vary from course to course. (F,SP)

160. Political Economy in Historical Context. (4) Course may be repeated for a maximum of 8 units. Three hours of lecture per week. Prerequisites: 100 and 101 or consent of instructor. This course focuses specifically on the historical context and perspective of the relationships between politics and economics in modern societies. Students are guided through an interdisciplinary survey of the historical experience of peoples and places who have participated in the ongoing processes of transformation from agricultural societies to the rise of the industrial state and on to post-industrialism. Each term provides a different perspective of this transformation. (F,SP) Staff

192. Senior Thesis. (3) Individual weekly meetings. Prerequisites: Upper division standing and consent of instructor. This course is designed to provide a vehicle for undergraduate students interested in writing a major paper on a political economy topic. The paper should be approximately 35 pages in length; the topic should be chosen in advance by both the student and faculty sponsor. (F,SP)

H195. Senior Honors Thesis Seminar. (2) Two hours of seminar plus one hour of consultation per week. Prerequisites: International and Area Studies 102 and consent of instructor. Senior standing. Formerly H195A-H195B. Honors students identify research and write a thesis based on the prospects developed in International and Area Studies 102. The thesis work is reviewed by the honors instructor and a second reader selected based on the thesis topic. Weekly progress reports required. (SP)

196. Special Field Research. (1-6) Course may be repeated for a maximum of 12 units. 240-300 hours work per semester plus regular meetings with the faculty supervisor. Prerequisites: Consent of instructor. Students to work in selected internship programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring agencies and the student. Students will be expected to produce two progress reports for their faculty coordinator during the course of the internship, as well as produce a final paper for the course consisting of at least 35 pages. Other restrictions apply; see faculty adviser. (F,SP)

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units; 240-300 hours of work per semester plus regular meetings with the faculty supervisor. Students work in selected internship programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring agency and the student. Students will be expected to produce two progress reports for their faculty coordinator during the course of the internship, as well as produce a final paper for the course consisting of at least 35 pages. Other restrictions apply; see faculty adviser. Also listed as Gender and Women’s Studies C196W, History of Art C196W, Undergrad Interdisciplinary Studies C196W, History C196W, Sociology C196W, Political Science C196W, and Media Studies C196W.

197. Field Studies. (1-4) Prerequisites: 100, 101 or consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to PE majors. Content and credit vary from course to course. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Group meetings to be announced. Must be taken on a passed/not passed basis. Prerequisites: Upper division standing and consent of instructor. This course is designed to accommodate cross-listed courses offered through other departments, the content of which is applicable to PE majors. Content and credit vary from course to course. (F,SP)

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. Individual meetings, to be announced. Must be taken on a passed/not passed basis. Prerequisites: Written proposal must be approved by a faculty adviser. Enrollment restricted by regulations of the college. (F,SP)

Political Science
(College of Letters and Science)

Department Office: 210 Barrows Hall, (510) 642-6323 polisci.berkeley.edu Chair: Taeku Lee, Ph.D. Professors


Kevin O’Brien, Ph.D. Yale University. Comparative politics, Chinese, social movements

J. T. Pempel, Ph.D. Columbia University. Comparative politics, political economy, contemporary Japan and Asian societies

Paul Pierson, Ph.D. Yale University. Comparative political economy and social policy, political response to poverty in Western Europe and the United States

Robert L. Powell, Ph.D. University of California, Berkeley. Formal theory and methodology

Gerard Roland, Ph.D. Université Libre de Bruxelles (ULB). Transition, political, and institutional economics

Erie Scholker, Ph.D. Yale University. Latin American politics. J. Merrill Shanks, Ph.D. University of Michigan. Research methodology and techniques, electoral behavior and public opinion

Shannon C. Stimson, Ph.D. Harvard University. Political theory, political philosophy, urban politics

Philip E. Tetlock, Ph.D. Yale University. Political psychology, cognitive style, cognitive biases and heuristics, accountability in decision making

D. Paul Thomas, Ph.D. Harvard University. Political theory, Modernist theory

David J. Vogel, Ph.D. Princeton University. Governmental regulation and international economic environment, comparative politics

Steven Vogel, Ph.D. University of California, Berkeley. Comparative, comparative and international political economy

Steven Weber, Ph.D. Stanford University. International relations, U.S.-Soviet relations, national security

Margaret M. Weir, Ph.D. University of Chicago. Historical and political sociology, employment, race, poverty, urban issues

John Zysman, Ph.D. Massachusetts Institute of Technology. Comparative politics, Western European politics

Yos Honda, Ph.D. University of Tokyo. Comparative politics, political economy

Giuseppe Di Palma (Emeritus), Ph.D. *A. James Gregor (Emeritus), Ph.D. Andrew C. Janos (Emeritus), Ph.D. *Kenneth T. Jowell (Emeritus), Ph.D. *Todd R. La Porty (Emeritus), Ph.D. David Leonard (Emeritus), Ph.D. David Williams (Emeritus), Ph.D. *Hanna Pitkin (The Kemon R. Robinson Professor of Political Science Emerita), Ph.D. Robert M. Price (Emeritus), Ph.D. Robert A. Scalapino (Emeritus), Ph.D. Peter W. Sperlich (Emeritus), Ph.D. Kenneth Waltz (Emeritus), Ph.D. *Harold L. Wilensky (Emeritus), Ph.D. Raymond E. Wolffinger (Emeritus), Ph.D.

Associate Professors

Christopher Ansell, Ph.D. University of Chicago. Organization theory, politics of executives

Kathleen A. Arnold, Ph.D. Harvard University. Comparative politics, political economy of development, Middle East Ernesto Dal Bo, Ph.D. University of Oxford. Political institutions

Segan Gaimard, Ph.D. California Institute of Technology. Formal and quantitative methodology, evaluating political institutions

John D. Levy, Ph.D. Massachusetts Institute of Technology. Comparative politics, political economy, European political development, French politics

Jasmin Sekhon, Ph.D. Cornell University. Public policy, public opinion, and policy evaluation; statistical methods, applied statistics, causal inference

Laura L. Stoker, Ph.D. University of Michigan. Political behavior, election studies, ethics and politics, methodology

J. Nicholas Ziegler, Ph.D. Harvard University. European politics and comparative political economy

Assistant Professors

Leonardo R. Ariola, Ph.D. Stanford University. Comparative politics, African political development Ron Hassner, Ph.D. Stanford University. International security, religious violence, Middle Eastern politics and territorial disputes

Kinch Hoeckstra, D. Phil. University of Oxford. History of political thought, political theory

Peter Lorenzen, Ph.D. Stanford University. Economics, political economy, developing countries, China

Alison Post, Ph.D. Harvard University. Government, comparative politics, political economy, urban policy, Latin America

Robert Van Houweling, Ph.D. Harvard University. American politics, political economy

Jason Wittenberg, Ph.D. Massachusetts Institute of Technology. Eastern Europe and the Post-Soviet region.

Lecturer

Terri L. Bimes, Ph.D. Yale University. American politics

Adjunct Professor

Beverly Crawford, Ph.D. University of California, Berkeley

Associate Adjunct Professor

Edward Walker, Ph.D. Columbia University

*Recipient of Distinguished Teaching Award
The Major

Note: Beginning fall 2008 for freshmen entering the University and fall 2009 for entering junior transfers and fall 2009 for entering senior transfers, the major's requirements for declaring and completing the major listed below. The new requirements do not apply to students who entered Berkeley prior to these respective dates.

Undergraduate Curriculum. For freshmen admitted to Berkeley fall 2008 and onward and junior transfers admitted to Berkeley fall 2009 and onward, the political science major is now comprised of: (a) five lower-division courses (from PS 2, 4, or 5); PS 3; and (b) eight upper-division political science courses and one history course for a total of 12 courses (48 units). Within the major, students are required to take at least one course (lower or upper-division) in each of the five primary subfields—American politics, comparative politics, empirical theory and quantitative methods, political theory, international relations—and must also specialize in one subfield by completing the introductory course and two upper division courses in that subfield. Completion of any two of the introductory courses PS 1, 2, 4, or 5 is required to declare the major.

For freshmen who entered Berkeley prior to fall 2008 and junior transfers admitted prior to fall 2009, the requirements for the major are: PS 1, 2, 3; two history courses (one on U.S. history and one relating to another geographical area of the world); and any seven upper-division political science courses from those numbered 102-175A, 181-189, including 191. These requirements amount to 12 courses (48 units). Completion of PS 1 and 2 is required to declare the major.

Advanced placement credit does not satisfy any major prerequisites, but students scoring 4 or 5 on the American Government Advanced Placement Exam may substitute an upper-division American political science course before or after declaring the major. This course, however, may not also be used to fulfill an upper division requirement.

A list of approved history courses, specific requirement information, and detailed course descriptions are available on the department website at polisci.berkeley.edu/undergrad.

All major requirements must be taken on a letter-grade basis.

To declare the major, students must have completed the minimum eligibility requirements in place when they were first admitted to Berkeley (see above), and must attend a declaration-orientation session. The session schedule is posted on our website at polisci.berkeley.edu/undergrad/declaring. Declarations must be done in person. Transfer students may visit assist.org for a list of California community college courses that satisfy University and major requirements.

Honors Program. Declared political science majors with a 3.5 GPA in the major and a 3.3 GPA overall, who have senior standing, and who have completed PS 3 and at least two letter-graded upper-division political science courses at Berkeley, are eligible to apply for the Honors Program. The Honors Program consists of a two-semester seminar, H190A and H190B (offered in fall/spring only), and culminates in the writing of an honors thesis. Students must also obtain the supervision of a member of the faculty who will guide the research. Applications can be made only at polisci.berkeley.edu/undergrad/opportunities/honors. Departmental honors are awarded upon completion of the honors seminar with a grade of B+ or better, a minimum GPA of 3.5 in the major, and a 3.3 in UC Berkeley. For complete details, contact an undergraduate adviser in 296 Barrows Hall or visit polisci.berkeley.edu/undergrad/opportunities/honors for further information. For specific information on field or area concentrations in political science, consult faculty members.

Further Information. Information about the undergraduate program may be obtained from our website at polisci.berkeley.edu/undergrad.

Graduate Program

Information about the graduate program may be obtained from our website at polisci.berkeley.edu/grad.

Lower Division Courses

1. Introduction to American Politics. (4) Three hours of lecture and one or two hours of discussion per week. An introduction to American politics with an emphasis on the structure of the American political system, primarily at the national level. (F,SP)

1AC. Introduction to American Politics. (4) Three hours of lecture and one and one-half hours of discussion per week. Politics is the art and noise of collective governance under conditions of scarce resources, conflicting interests, diverse beliefs, uncertain outcomes, and unequal power. In 1AC, we learn about the institutions, ideologies, and processes that constitute politics in the United States. In fulfilling the American Cultures requirement, we further examine how power, equality, and diversity are configured and contested in our politics. The course emphasizes active research and group-based learning. (F,SP)

2. Introduction to Comparative Politics. (4) Three hours of lecture and one or two hours of discussion per week. This course deals with the basic problems and processes that all political systems face and examines their particular expression in Western, Communist, and Third World settings. (F,SP)

3. Introduction to Empirical Analysis and Quantitative Methods. (4) Three hours of lecture and one or two hours of discussion per week. Analytical and methodological problems of political inquiry, with an emphasis on quantification and measurement. (F,SP)

4. Introduction to Political Theory. (4) Three hours of lecture and one to two hours of discussion per week. An approach to the understanding of politics through the perspectives and language of the political theorist.

5. Introduction to International Relations. (4) Three hours of lecture and one to two hours of discussion per week. This course is designed to introduce students to the major theoretical approaches to international politics, to explore important historical and contemporary questions in international affairs, and to teach students to think critically about international relations. It is a prerequisite for most upper division international relations courses in political science. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit when topic changes. One hour of seminar per unit. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F,SP)

41. Freshman Seminar. (4) Course may be repeated for credit with consent of department. Three hours of seminar and one hour of conference per week. Topics, experimental in nature, will vary from year to year.

98. Directed Group Study for Lower Division Students. (1-3) Course may be repeated for credit with consent of department. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Lectures and small group discussion focusing on topics of interest that vary from semester to semester.

99. Supervised Independent Study. (1-4) By arrangement with faculty. Must be taken on a passed/ not passed basis. Prerequisites: Completion of two political science courses and approval of the supervised independent study and research for lower division students, pursuant to the Regulations of the Berkeley Division, Section A230.

Upper Division Courses

American Politics

102. The American Executive. (4) Three hours of lecture and one hour of discussion per week. Analysis of principal institutions, functions, and problems of the Presidency and the federal executive branch. Special attention will be given to the political characteristics, leadership, legislative-relations, and policy formation. Comparative reference to executive processes in other political systems. (F,SP)

103. Congress. (4) Three hours of lecture and one to three hours of discussion per week. Prerequisites: 1 or consent of instructor. Nomination and election, constituent relations, the formal and informal structures of both houses, relations with the executive branch, policy formation, and lobbying. (F,SP)

103W. The Congress. (4) Two to three hours of seminar per week. Prerequisites: Admittance to UC Berkeley Washington Program. For details, visit learning.berkeley.edu/ucdc. This course will explore the Congress—the first branch under the Constitution—and its role in the political environment in Washington by featuring frequent guest speakers and seeking connections to current policy and political debate. In addition to surveying the pathways of lawmaking, we will ask how Congress and its members relate to the other branches of government, to the press, and to the public. (F,SP)

104. Political Parties. (4) Three hours of lecture and one hour of discussion per week. The institutional environment within which American politics takes place and the concept of political parties examined in the context of their nature and function, origin and development, party organization and structure. State, national, and local party systems and their variations. Nominations and elections. One directed research paper will be required. (F,SP)

105. The Politician. (4) Three hours of lecture and one hour of discussion per week. The nature of politics, the education of politicians, the structure of ambition, and the ethical values of social behavior in the political world. Policy, norm, and the appropriate exercise of power, fairness in processes that all political systems face and examine their particular expression in Western, Communist, and Third World settings. (F,SP)

106A. American Politics: Campaign Strategy— Media. (4) Three hours of lecture per week. Prereq- uisites: Junior or senior standing. An inside look at how political campaigns operate from the viewpoint of the media, taught by the people who run them. The course will be directed toward those who are interested in direct involvement in campaign politics or who are looking for a greater understanding of the political process. Students will be required to complete a campaign in order to fulfill class requirements. Students will be expected to follow political campaigns via the media and be prepared to discuss topics in class.

108A. Politics, Ethics, and Leadership. (4) Three to four hours of lecture and one hour of discussion per week. Those who decide to participate in politics must inevitably make ethical choices. Too often, the moral bases of political decisions are unexamined. This course looks at the political choices of leaders and citizens as they relate to honesty and public rhetoric, corruption and public trust, influence and the appropriate exercise of power, fairness in pro-
109. Special Topics in American Politics. Three hours of lecture and one hour of discussion per week. See department website for specific course offerings. (F,SP)

109W. Selected Topics in American Politics-UCDC. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Admission to UC Berkeley Washington Program. For details, visit learning.berkeley.edu/ucdc. Formerly 108W. Topics will vary.

110B. Cal-in-Sacramento. (2) Course may be repeated for credit with consent of department. Two hours of seminar per week. Must be taken on a passed/not passed basis. Prerequisites: Limited to summer Cal-in-Sacramento interns. The purpose of this course is to provide Cal-in-Sacramento interns and other interested Berkeley students with a rudimentary understanding of our state government. We will focus on the state legislature and executive branch, exploring both the policy-making process and the politics in Sacramento, which we will learn are quite closely related to one another.

111AC. The Politics of Displacement. (4) Four hours of lecture per week. Antebellum American political history brings to mind a routine script in which the purpose of the Revolution was to liberate Americans for self-government and economic and social development. Slavery is viewed as an anomaly still needing explanation, and Native American relocation as the consequence of natural forces of immigration and pre-modern social values. In this class, the revolution against traditional political authority embodied in Jefferson's and Thomas Paine's attack on the British crown, the rise of slavery, and the conflict with Native America are seen as coherent parts of a cultural and social development that emerges in the 18th- and 19th-century national republic. Using both original antebellum materials, including biographies, history, and literature, and contemporary images from American popular culture such as film, news and magazine articles, and other media, we will compare and contrast the experiences of antebellum Native Americans, European immigrants, and African slaves as a connection between the past and the present emerges. This course satisfies the American Cultures requirement. (F,SP) Staff

Political Theory

112A. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of conference per week. Major theories from the ancient Greeks to contemporary thought, including Plato, Aristotle, and St. Augustine. (F,SP)

112B. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of conference per week. Nineteenth- and 20th-century political thought, including Burke, Utilitarianism, Marx, and contemporary theory. (F,SP)

112C. History of Political Theory. (4) Three hours of lecture, two hours of discussion, and one hour of conference per week. The intellectual divide between these different approaches is the consequence of natural forces of immigration and pre-modern social values. In this class, the revolution against traditional political authority embodied in Jefferson's and Thomas Paine's attack on the British crown, the rise of slavery, and the conflict with Native America are seen as coherent parts of a cultural and social development that emerges in the 18th- and 19th-century national republic. Using both original antebellum materials, including biographies, history, and literature, and contemporary images from American popular culture such as film, news and magazine articles, and other media, we will compare and contrast the experiences of antebellum Native Americans, European immigrants, and African slaves as a connection between the past and the present emerges. This course satisfies the American Cultures requirement. (F,SP) Staff

114A. Theories of Governance: Late 20th Century. (4) Three hours of lecture and one hour of discussion per week. What is governance? How should we explain it? What are its implications for public policy and democracy? This course uses debates about contemporary governance to examine four approaches to political science and political theory. The approaches include liberal, institutional, Marxist, and post-structuralist. The course looks at the narrative that each approach provides of the origins and workings of governance since 1979, and at the two broad narratives (ideology vs. commitment) about rationality and power, structure and agency, and democracy. It thus promotes an awareness of the way questions about contemporary governance reflect philosophical, political, and normative commitments. This course has a required discussion section. (F,SP)

115C. Marxism and Culture. (4) Three hours of lecture and two hours of discussion per week. The purpose of this course is to trace the development of Marxism as an idea system and political ideology since its inception, focusing particularly on developments in "Communist" or "State Socialist" systems, but also including a broad look at Euro-Communist thought. See department website for specific course offerings. (F,SP) Staff

118A. Three American Cultures. Course may be repeated for credit with department approval. Three hours of lecture, two hours of discussion per week. The purpose of the course is to examine three American cultural forms. The forms of the course to be comparative; readings will center around first-person accounts, written by members of the ethnic groups, with emphasis on the development in each of the cultural forms. The form is that of identity, seen politically as well as culturally: examining how the various ethnic groups have contributed to a collective identity for themselves. The three groups studied will be selected by instructor. See department listings for more specific information. This course satisfies the American Cultures requirement. (F,SP)

International Relations

120A. International Relations. (4) Three hours of lecture and one hour of discussion per week. Comparative foreign policy. (F,SP)

122A. Politics of European Integration. (4) Three hours of lecture and one to two hours of discussion per week. Can the integration be advanced in governance beyond the level of the traditional nation-state. Through the European Union, the main members countries have pooled their national sovereignty and found new ways of political authority, economic competition, social cohesion, and cultural identity. While specialists in comparative politics focus on the separate countries, scholars in international relations emphasize the construction of supranational institutions and transnational identities. This course seeks to synthesize the comparative and international approaches by examining the economic, political, and cultural aspects of integration. Readings are drawn from international relations, comparative politics, public policy, sociology, and some anthropological debates. Course requirements include course readings, class discussions, participation in a group report, and one of the major areas mentioned above, and a closed-book final. Staff

122AW. Politics of European Integration. (4) Students will receive no credit for 122AW after taking 122A. Three hours of lecture and one hour of discussion per week. The European Union is the world's most advanced experiment in governance beyond the level of the traditional nation-state. As France, Britain, Germany, and other member states have pooled their sovereignty, they have created new ways of organizing the realities of economic competition, political authority, social cohesion, and cultural identity. Not surprisingly, there are several divisions among social scientists who study Europe. Specialists in comparative politics focus primarily on the development of national polities, while scholars in international relations devote most of their attention to the construction of supranational institutions. Economists are especially interested in Europe's intergovernmental and interparliamentary relations. Sociologists and anthropologists have meanwhile focused growing attention to transnational interest groups, religion, and identity. The course seeks to bridge the intellectual divide between these different approaches by examining economic, political, and cultural aspects of integration. Readings are drawn primarily from the fields of international relations, comparative politics, and public policy. (F,SP) Siegler

124A. War! (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 5. War, what is it good for? Absolutely nothing! Is this necessarily true? Wars are brutal and horrific events but are they all necessarily the result of miscalculation, accident, or fanaticism? Can war serve a rational purpose? Are wars governed by rules or do states care about these rules? This course is designed for upper-level undergraduate students. (F,SP) Staff

124C. Ethics and Justice in International Affairs. (4) Three hours of lecture and one to two hours of discussion per week. Should nations intervene in other countries to prevent human abuses or famine? On what principles should immigration be based? Should wealthy states aid poorer states, and if so, how much? Who should pay for global environmental damage? Answers to these questions depend on our views of who we believe we have an obligation to: Ourselves? Nations of our country? Residents of our country? Everyone in the world equally? The three groups studied will be selected by the instructor including skeptics, communists, cosmopolitans, and use these traditions as tools to make reasoned judgments about difficult moral problems in world politics. (F,SP) Staff

126A. International Political Economy. (4) Three hours of lecture and one hour of discussion per week. Economic concepts in the study of international political behavior. Political concepts influencing the choice of economic policies.

128. Chinese Foreign Policy. (4) Three hours of lecture and one hour of discussion per week. This course covers the history and analysis of Chinese foreign policy since the inception of the People's Republic of China in 1949. Some attention is devoted to pre-1949 Great China and its international relations as a background to the study of the contemporary period. Emphasis is placed on Sino-American and Sino-Soviet relations, the domestic determinants of Chinese foreign policy, the changing nature of China's relations with her Asian neighbors, and important substantive issues.

129B. Russia After Communism. (4) Three hours of lecture and one hour of discussion per week. Russian foreign policy from the inception of the People's Republic of China in 1949 to the present. This course aims at providing the student with sufficient factual base, alternative theoretical approaches and some of the methodological tools useful in studying Chinese foreign policy.

132B. Russia After Communism. (4) Three hours of lecture and one hour of discussion per week. How much? Who should pay for global environmental damage? Answers to these questions depend on our views of who we believe we have an obligation to: Ourselves? Nations of our country? Residents of our country? Everyone in the world equally? The three groups studied will be selected by the instructor including skeptics, communists, cosmopolitans, and use these traditions as tools to make reasoned judgments about difficult moral problems in world politics.
Most of the course is devoted to the post-communist period and current problems of political change and upheaval. Topics to be investigated include the movement from command economy to capitalism, struggles among emerging social interests, the changing role of the military in society, crime and social disintegration, the rise of nationalism and the search for national identity, conflict over territorial questions, and problems of political institutions. The course is recommended for juniors and seniors but is open to all students. (F,SP)

**Empirical Theory and Quantitative Methods**

C131A. Applied Econometrics and Public Policy. (4) Three hours of lecture and zero to one hour of discussion/laboratory per week. Prerequisites: ECON 140 or 141 or consent of instructor. This course focuses on the application of econometric methods to the study of economic and public policy problems. It is intended for students wishing to pursue graduate studies in the social sciences and economics. (F,SP) Staff

C135. Game Theory in the Social Sciences. (4) Students will receive no credit for C135 after taking Economics 104. Three hours of lecture and one hour of discussion per week. Prerequisites: C135. A non-technical introduction to game theory. Basic principle, and models of interaction among players, with a strong emphasis on applications to political science, economics, and other social sciences. Also listed as Economics C110. Staff

**Comparative Politics**

136A. Theory in Comparative Analysis. (4) Three hours of lecture and one hour of discussion per week. Major themes in comparative analysis. Political systems, culture, authority and other themes in the study of macro-politics. Subject matter will vary with instructor. For details, consult department announcements. (F,SP)

137A. Revolutionary Change. (4) Three hours of lecture and one hour of discussion per week. Theories of revolutionary violence, rebellion, and revolution. Strategies of revolution, terrorism, sources of revolutionary appeal. (SP) Staff

137B. Revolutionary Movements. (4) Three hours of lecture and one hour of discussion per week. Ideas as instruments of political action. A comparison of radical movements from the Middle Ages to the present day, emphasizing reactions to the rise of modern economic, industrial society, and the post-industrial age. (F,SP)

137C. Democracy and Its Alternatives in The Developing World. (4) Three hours of lecture and one hour of discussion per week. This course offers a critical study of the wave of democratization that swept much of Latin America, Southern Europe, East Asia, Africa, Eastern Europe, and the former Soviet Union during the past three decades. We will analyze the theoretical and ideological underpinnings of regime change and compare experiences of countries emerging from bureaucratic authoritarianism, military rule, personalistic dictatorships, and state socialism. In addition to dealing with democratization, the course will address the reverse phenomena, meaning movement from more democratic to more authoritarian regimes, a tendency that has been increasingly evident during the past decade. We will investigate, among other topics: the meaning of democracy and authoritarianism, the factors that facilitate or hinder democratization, the roles of mass movements, the significance of constitutional arrangements, political conflict and ethnic conflict, and the relationship between economic transformation and political regime change. (F,SP)

138E. The Varieties of Capitalism: Political Economic Systems of the World. (4) Three hours of lecture and one and one-half hours of discussion per week. This course examines the interaction between politics and markets, both in theory and in practice, exploring the link between works on political economy and current policy debates. We study how political systems and markets are organized in a wide range of different national settings, looking at both history and contemporary issues. Topics include: (1) early industrialization in Britain and the United States; (2) late industrialization in continental Europe and Japan; (3) the varieties of capitalism in contemporary industrialized economies; (4) the privatization of the economies of Latin America and East Asia; (5) the problems of development; and (6) the transition from communism to a market economy in Eastern Europe and China. (F,SP) Staff

138F. Immigrants, Citizenship, and The State. (4) Four to five hours of discussion per week. This course will examine the migration from a command economy to capitalism, struggles over political boundaries and resources are limited. Furthermore, China's extraordinary growth has in some respects challenged social scientists to think more deeply about the foundations and limits of the market economy. Furthermore, China's ever-increasing economic freedom and prosperity has been accompanied by only limited steps to political freedom, running counter to one of the most consistent patterns of comparative politics and history. This class will cross conventional boundaries between political and economic analysis in order to address these issues. (F,SP) O'Brien

139B. Development Politics. (4) Three hours of lecture and one and one-half hours of discussion per week. Politics of economic development in developing countries. Comparative analysis of the theories and practice of development in the light of comparative experience. Political strategies of agrarian, industrial, educational, and regional development and their impact on autonomy, welfare, justice, and human development. (F,SP) Yizman

139D. Urban and Sub-national Politics in Developing Countries. (4) Three hours of lecture and one to two hours of discussion per week. Half of the world's population is now urban. As urban populations swell, metropolitan areas in both the developed and the developing world struggle to provide basic services and address the negative externalities associated with rapid growth. Sanitation, transportation, pollution, energy services, and public safety typically fall to local governments. Local sub-national institutions face difficulties as they tackle these challenges because development trends to spill over political boundaries and resources are limited. The course will analyze the developing world due to tighter resource constraints, weak institutions, and the competitive severity of the underlying problems. Moreover, democratization and decentralization suggest that urban governance and service delivery may have become more democratic, but present challenges with respect to priority setting, coordination, and corruption. (F,SP)

140. Selected Topics in Comparative Politics. Four hours of lecture and one hour of discussion per week. Visit department website for specific course offerings. (F,SP) Staff

**Area Studies**

141C. Politics and Government in Eastern Europe. (4) Three hours of lecture and one hour of discussion per week. The democratic and post-communist states in the states of Eastern Europe presented within a broader cultural, historical, and sociological framework. Problems of economic underdevelopment and political fragmentation. Comparisons of the pre-Communist, Communist, and post-Communist periods. (F,SP)

142A-142B. Middle East Politics. (4,4) Three hours of lecture and one to three hours of discussion per week. The Middle East in world affairs, international relations and domestic policies of contemporary states in the Middle East; policies and strategy of major powers; supranational movements, regional political and social security organizations. The area comprises Turkey, Iran, Afghanistan, Israel, and the Arab countries. (F,SP)

143A. Northeast Asian Politics. (4) Three hours of lecture and one to one-half hours of discussion per week. The structure and evolution of political institutions in China, Japan, and Korea. Emphasis upon such topics as nationalism, political modernization, and ideology. (F,SP)

143B. Japanese Politics. (4) Three hours of lecture and one to one-half hours of discussion per week. The structure and evolution of political institutions in Japan. Emphasis upon such topics as political parties, the bureaucracy, social change, and temporary policy issues. (F,SP)

143C. Chinese Politics. (4) Three hours of lecture and one hour of discussion per week. An overview of Chinese politics since the fall of the Qing Dynasty. Emphasis on the People's Republic of China and post-Mao reforms. (F,SP) O'Brien

143E. The Political Economy of China. (4) Three hours of lecture and one hour of discussion per week. China's extraordinary growth has in some respects confirmed the power of free markets, but at the same time, it has challenged social scientists to think more deeply about the foundations and limits of the market economy. Furthermore, China's ever-increasing economic freedom and prosperity has been accompanied by only limited steps to political freedom, running counter to one of the most consistent patterns of comparative politics and history. This class will cross conventional boundaries between political and economic analysis in order to address these issues. (F,SP) Lorentzen

144B. Politics of Divided Korea. (4) Three hours of lecture and one hour of discussion per week. An overview of modern Korea divided into the Republic of Korea and the Democratic People's Republic of Korea. The course will compare the two Koreas in terms of political, social, and economic institutions; culture; political elites; and modernization strategy. (F,SP)

145A-145B. South Asian Politics. (4,4) Three hours of lecture and one hour of discussion per week. A comparative analysis of development and change in the political systems of contemporary South Asia. (F,SP)

146A. African Politics. (4) Three hours of lecture and one hour of discussion per week. Introduction to politics in the states of contemporary sub-Saharan Africa, with comparative study of political institutions and regime transitions; economic crisis and development; political violence and civil conflict. (F,SP)

146B. African Politics. (4) Three hours of lecture and one hour of discussion per week. In-depth analysis of selected African states; historical formation of their contemporary state structures and political systems, and the nature of current political processes and problems. Cases are chosen so as to highlight...
147A. Latin American Politics. (4) Problems in the post-war period.

147B. Western European Politics. (4) Three hours of lecture and one hour of discussion per week. The political development of Western Europe from feudalism to the 20th century. Topics include absolutism, commercialization of agriculture, English and French revolutions, industrialization, national unification, working-class movement, democratic and authoritarian regime outcomes, contemporary politics and policy. Focus on Britain, France, Germany, and Italy.

147F. Contemporary French Politics: The Republican Model in Transition. (4) Three hours of lecture and one hour of discussion per week. French political life has long gravitated around a “Republican model” marked by an unmediated relationship between the citizen and the state, socialization into French values through secular public education, a special vocation for France on the international stage, and an activist state. Recent developments have called the Republican model into question. This course will examine the transformation of France’s Republican model—its origins, operations, and responses to contemporary challenges. (F.SP) Staff


147H. The Domestic Politics of Post-War Western Europe. (4) Three hours of lecture and one hour of discussion per week. This course examines the different ways in which the leading nations of Western Europe—Britain, France, Germany, and to a lesser extent Sweden—have confronted common problems in the post-war period.

148A. Latin American Politics. (4) Three hours of lecture and one to three hours of discussion per week. Political institutions, groups and parties in Latin American countries. Basic characteristics of political processes in Latin America; problems of political development and modernization and political change. Comparative study of political systems, institutions, groups, and political culture. (F.SP)

149. Special Topics in Area Studies. Three hours of lecture and one hour of discussion per week. Visit department website for specific course offerings. (F.SP) Staff

Public Law and Jurisprudence

150. The American Legal System. (4) Students who have passed H40 and at least one 188-prefix or 198-prefix academic year will receive credit for 150. Three hours of lecture and one hour of discussion per week. The nature of the American legal system; the interrelations of judges, lawyers, police, political officials, bureaucrats, press, and general public; the political and social aspects of the legal process. (F.SP)

152. Selected Topics in Public Law. Four hours of lecture and two hours of discussion per week. Pre-requisites or equivalent. In contemporary democracies, law, courts, and other legal institutions—law enforcement agencies, regulatory bodies, administrative tribunals, the legal profession—play an ever-increasing role in the government of society. This course will examine the doctrine of the political science, legal and sociopolitical literature on topics related to the design, staffing, and operation of legal institutions, the formulation of law, and the struggle for political power. Visit department website for specific course offerings. (F.SP) Staff

157A-157B. Constitutional Law of the United States. (4) Three to four hours of lecture and one to two hours of discussion per week. Fundamental principles of constitutional law, leading cases, causes, and contemporary issues. Credit toward legal education and their role in influencing, shaping, and constraining the American political system.

A. Judicial Review and the Limits to National Power.
B. Civil Rights and Civil Liberties. (F.SP) Staff

Public Behavior

161. Public Opinion, Voting, and Participation. (4) Three hours of lecture and one hour of discussion per week. The nature of public opinion, attitude formation, electoral turnout and choice; political cleavages; the role of the mass public. (F.SP)

164A. Political Psychology and Involvement. (4) Three hours of lecture and one hour of discussion per week. Personality factors in political behavior; psychological factors in making; leadership; psychological sources of political belief; conflict theory. (F.SP)

166. Latinos and the U.S. Political System. (4) Three hours of lecture and one hour of discussion per week. The political development of the United States. Latinos became the nation’s largest “minority” group in 2005 and are also the largest minority group in U.S. elementary/secondary schools. For these and other reasons, the situation of Latinos has broad social and political significance. (F.SP)

167AC. Racial and Ethnic Politics in the New American Century. (4) Three hours of lecture and one hour of discussion per week. Some of the most enduring and violent conflicts in America center on race. The goal of this course is to explore, discuss, and better understand these conflicts between perceptions of racial identity, attributes of racial difference, and politics, broadly defined. We focus on the recent and persistent debates about racism, identity, rights, representation, citizenship, conflict, and coalitions. A repeated theme of this course is the question whether racial order and inequality are essential to, or an exception from, the liberal democracy in the United States. This course will engage with text readings, written assignments, and in-class discussion. This course satisfies the American Cultures requirement. (F.SP) Staff

Sub-National Government and Politics

171. California Politics. (4) Three hours of lecture and one hour of discussion per week. An inquiry into the political environment of the state—historical, economic, geographic, and social; its political institutions—government, parties, interest groups, and citizens; and the policies resulting from the interaction of environment and institutions.

173S. Political Economy of the California Crisis. (4) Course may be repeated for credit with consent of instructor. This course examines the emergence and crisis of California’s political economy. An analytical framework is developed that encompasses the secular growth cycle and cyclical variability of California’s income, expenditure, and revenue levels. California’s economic growth and political development since 1875 will be analyzed. Specific topics covered include the Edmund G. (Pat) Brown era; Proposition 13 and the Ronald Reagan governorship; California’s demographic transformation; challenges of minority economic development and political representation; the 2003 gubernatorial recall and the 2002-04 fiscal crisis. Course is part of the University of California Center Sacramento Program and is located in Sacramento. (F.SP) Dymark

177A. Urban and Metropolitan Government and Politics. (4) Three hours of lecture and one hour of discussion per week. The structure of various levels of government—local, regional, state, and national—in politics and policy making in metropolitan regions.

179. Undergraduate Colloquium on Political Science, (1) Course may be repeated for credit with consent of instructor. This course provides a “critical” analysis of the political circumstances, political behavior, and the activities and consequences of the American political system. (F,SP)

Public Organizations

181. Public Organization and Administration. (4) Three hours of lecture and one hour of discussion per week. The dynamics of public policy formulation within bureaucratic organizations; the interactions of the legislature and pressure groups; patterns of conflict within public organizations.

183. Administrative Behavior. (4) Three hours of lecture and one-half hours of discussion per week. Understanding the nature of public management. How do public administrators and officials behave? How do public organizations function? What are the characteristics of organizations or communities that are able to solve problems? How are public problems framed and how are they used to institutionalize solutions? This course draws on literature in public management, public policy, democratic theory to try to better understand some of the major social, political, environmental, and economic problems of our contemporary world. (F,SP) Ansell

186. Public Problems. (4) Three hours of lecture and one-half hours of discussion per week. The nature of public problems seems to grow every year. This course explores the way societies try to address and solve difficult and seemingly intractable public problems. Can we attribute success or failure to institutions and their capacity to solve problems? Are problems difficult to solve because they are complex or because they are unimportant? What are the characteristics of organizations or communities that are able to solve problems? How are public problems framed and how are they used to institutionalize solutions? This course draws on literature in public management, public policy, democratic theory to try to better understand some of the major social, political, environmental, and economic problems of our contemporary world. (F,SP) Ansell

Special Studies

H190A. Honors Seminar. (2) Two hours of seminar per week plus individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Must be a declared political science major with a 3.5 GPA in the major and a 3.3 GPA overall. Eligible students must have taken at least two letter-graded, upper-division political science courses at Berkeley. H190A is the first of a two-semester research seminar designed to provide support and structure to political science seniors writing an honors thesis. To receive department honors, students must maintain the minimum GPA for honors and complete H190B with a B+ or better. For additional details, contact the Undergraduate Advising Office or visit polisci.berkeley.edu. (F,SP) Staff

H190B. Honors Seminar. (2) Two hours of seminar per week plus individual conferences. Prerequisites: Consent of instructor. Must be a declared political science senior with a 3.5 GPA in the major and a 3.3 GPA overall. Eligible students must have taken at least two letter-graded, upper-division political science courses at Berkeley. H190B is the second of a two-semester research seminar designed to provide support and structure to political science seniors writing an honors thesis. To receive department honors, students must maintain the minimum GPA for honors and complete H190B with a B+ or better. For additional details, contact the Undergraduate Advising Office or visit polisci.berkeley.edu. (F,SP) Staff

191. Junior Seminar. (4) Students are allowed to take one seminar per semester while in junior status. Three to four hours of lecture per week. Prerequisites: Open to political science majors only. The seminars will be led by ladder-rank faculty members in the subfields of American politics, international relations, and comparative politics. Interested students must complete 191A with a B+ or better. For additional details, contact the Undergraduate Advising Office or visit polisci.berkeley.edu. (F,SP) Staff

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the department chairman one month in advance of earned. Must be taken on a pass/not passed basis. Prerequisites: Consent of faculty supervisor and department chair. Independent study of an advanced topic resulting in a substantial research paper. (F,SP)

196. Special Research Project. (1-4) Course may be repeated for credit. Regular individual meetings with faculty sponsor. Prerequisites: Consent of faculty supervisor and department chair. Independent study of an advanced topic resulting in a substantial research paper. (F,SP)

196S. UC Sacramento Internship and Research Seminar. (9-13) Course may be repeated for credit with consent of instructor. Unit credit will be based on the number of hours of the internship. Three hours of seminar and 24 to 36 hours of internship per week. Prerequisites: Consent of instructor. This seminar will introduce students to the theory and practice of policy analysis and development as it relates to legislative action at the state level to maximize students’ internship experience. The internship component of the course will provide students with a challenging opportunity to engage in experiential learning in some aspect of the political, policy-making, or governmental processes in California’s state capital. This course permits students to develop a systematic understanding of the public policy and political process in California and to develop analytical writing skills to produce a 25-30 page paper developing and reflecting on this understanding. This course is part of the University of California Center Sacramento Program and is located in Sacramento. (F,SP) Dymski

196W. Understanding the Congressional World: A Field Research Seminar. (10.5) Two hours of seminar, one hour of colloquium, three hours of fieldwork, and 18 hours of internship per week. Prerequisites: Admission to UC Berkeley Washington Program. This research seminar will explore the workings of Congress and its public policy. It consists of a selective coursework with the original scholarship requirements of a UCDC research seminar and is designed for students in Congressional internships and those considering Congressional staff positions after graduation. In addition to studying the pathways of lawmaking, we will ask how Congress and its Members relate to the other branches of government, the press, and the public. (F,SP)

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours of work per semester plus regular meetings with the faculty supervisor. Prerequisites: Consent of instructor. Formerly 196W. Students work in selected internship programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring organization and the student. Students will be expected to produce two progress reports for their faculty coordinator during the course of the internship, as well as a final paper for the course consisting of at least 35 pages. Other restrictions apply; see faculty adviser. Also listed as Gender, Art C196W, Undergrad Interdisciplinary Studies C196W, History C196W, Political Economy C196W, Sociology C196W, and Media Studies C196W.

197. Field Study in Political Science. (1-3) By arrangement. Must be taken on a pass/not passed basis. Prerequisites: Consent of faculty supervisor and department chair. Supervised experience relevant to specific aspects of political science in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP)

198. Directed Group Study for Undergraduates. (1-4) Course may be repeated for credit. By arrangement with faculty. Students must produce a minimum of 10 pages of written work for each unit of credit earned. Must be taken on a pass/not passed basis. Submission of study proposal by faculty sponsor to the department chairman one month in advance of the semester to be offered. Group studies of selected topics which vary from year to year.

199. Supervised Independent Study and Research for Undergraduates. (1-4) Course may be repeated for credit. By arrangement with faculty. Must be taken on a pass/not passed basis. Prerequisites: Open only to juniors and seniors. Enrollment is restricted by department regulation. (F,SP)

Graduate Courses

Properly qualified undergraduates may be admitted to graduate courses or seminars with special permission of the instructor.

Comparative Analysis

200. Major Themes in Comparative Analysis. (4) Three hours of seminar per week. Subject and texts to be studied vary with instructor. See department announcements.

201A-201B. Comparative Analysis of Industrial Democracies. (4) Three hours of seminar per week. The comparative study of politics in Western societies, the place of parties, political structures, interest groups, and economic institutions. The relation between domestic political developments and the international system. The effect of development on political change. The effect of labor politics on national politics.

201D. Governance of the Economy. (4) Three hours of lecture per week. New digital technologies, changing market structures, and innovative business organizations are transforming the economic and social landscape of the advanced industrial countries. The policy issues associated with this transformation pose fundamental philosophical and political questions of how to organize our markets, politics, and society. The course will seek to engage students in an ongoing debate about market social welfare concerns with the means of making and implementing these choices. Politics. The necessarily global scope of the E-Economy extends the political and policy challenges to the international arena. This course will focus on the literature on the political economy of the Internet to determine what choices and why political debates are and will be most important. We will also examine our conceptual understanding of the burgeoning digital economy and its impact on politics, law, and socioeconomic relations.

202A. Theories of Development and Political Change. (4) Three hours of seminar per week. Issues of social organization and political change. Theories of progress, development, modernization, and dependence.

203. Metropolitan Governance in Developing Countries. (4) Two to three hours of seminar per week. Prerequisites: Graduate student standing. Metropolization and development face place enormous challenges. This course will consider the political and institutional environment in which asset address metropolitan problems are developed, the financial and institutional vehicles used to provide services of different types, and the role of political parties and other political organizations in the development and allocation of services. Readings will be drawn from political science, sociology, geography, and economics. (F,SP)

208. Authoritarianism. (4) Three hours of seminar per week. This seminar explores the characterizations and dynamics of non-democratic regimes: how and why they come about, what sustains them, why some people resist and others do not, and how and why they decline and fall. While there are no formal methodological prerequisites for this course, we will encounter a variety of approaches, including formal, large-N statistical, and case-study methods. Our discussions will weave theoretical and methodological ideas with detailed analysis of historical and contempory dictatorial regimes. (F,SP) Wittenberg

209A. Comparative Political Economy. (4) Four hours of seminar per week. This seminar provides an introduction to the major debates in comparative political economy. Although the empirical focus is on the affluent democracies, many of the debates and issues analyzed have implications for other regions. The course is divided into two main parts. The first part examines leading theoretical perspectives on political economy, such as Friedman, Marx, Weber, and Polanyi. The second part of the course is more topical. It probes a number of examples of economic development, crisis, and change, with an eye to assessing alternative theoretical perspectives. (F,SP)

209B. Post Fordism: New Patterns of Production, Time, and Meaning in Contemporary Capitalism. (4) Three to four hours of seminar per week. With changes in technology, the internationalization of production and the massive increase in trans-border transactions of all kinds, it has been argued that we live in an era of substantively different capitalism. Were this true, it has deep implications for politics and for political economy. This graduate seminar explores the validity of this claim of a “new capitalism” through a variety of material. We will start with the question of whether “Fordism” ever existed, moving on to the question of whether “Post-Fordism” exists and ending with a variety of ethnographic studies that show how global production chains shape culture, gender, and hierarchy/power. (F,SP) Chaundhry

210. Selected Topics in Comparative Politics. (4) Course may be repeated for credit with different topic and consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

Political Theory

212A. History of Political Thought: Ancient and Medieval. (4) Three to four hours of seminar per week. A weekly seminar on political thought from the ancient Greeks to the Renaissance. Ancient and medieval political theorist, typically including Plato, Aristotle, St. Augustine, and Aquinas. (F,SP)

212B. History of Political Thought: Early Modern (Renaissance to French Revolution). (4) Three to four hours of seminar per week. A weekly seminar on political thought from the French Revolution. Early modern political theorist, typically including Machiavelli, Hobbes, Locke, Rousseau. (F,SP)

212C. History of Political Thought: Modern (French Revolution Through World War II). (4) Three to four hours of seminar per week. A weekly seminar on political thought in the 19th and early 20th centuries. Modern political theorists, typically including Tocqueville, Hegel, Marx, Mill, Nietzsche, and Weber. (F,SP)

213. Methodological Topics in the History of Political Thought. (4) Three to four hours of seminar per week. A weekly seminar on approaches to the historical study of political thought, typically including the nature of meaning and textuality, validity, and historical explanation. (F,SP)

214. Symposium in the History of Political Thought. (4) Course may be repeated for credit. Three to four hours of seminar per week. An intensive examination of the works of theorists, theories, or concepts in the history of political thought.

215A. Approaches to Contemporary Political Theory. (4) Three to four hours of seminar per week. A weekly seminar on contemporary approaches to political theory. (F,SP)

215B. Topics to Contemporary Political Theory. (4) Three to four hours of seminar per week. A weekly seminar on leading topics in contemporary political theory. (F,SP)

216. Symposium in Contemporary Political Theory. (4) Three to four hours of seminar per week. An intensive examination of a contemporary theorist, debate, or issue. (F,SP)

International Relations

220A. Theories of International Relations. (4) Three hours of seminar per week. Prerequisites: Previous work in international relations. Opportunity to study the origin, development, and utility of major concepts featured in the study of international relations. Relation of various strands of political and social theory to international relations.
223. Selected Topics in International Relations. (4) Course may be repeated for credit with different topic and consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

224. Sociological Traditions in International Relations. (4) Three to four hours of lecture per week. This seminar traces the development of the constructivist perspective on international relations in order to better understand its elements, assumptions, and methods and apply those to current issues. We start by uncovering the roots of constructivism in sociology and law and examine structural foundations in the English School, world systems theory, regime theory, and sociological institutionalism. The second part of the course focuses on the constructivist agenda in international relations, its boundaries and its critics. In the last part of the course, we examine current research in IR that draws on sociological methods, including work on the role of norms, epistemic communities, transnational civil society, and the origins of the state. (F.SP) Hassner

224A. International Security. (4) Two to four hours of lecture per week. The goal of this course is to introduce advanced political science graduate students to current debates in the field of international security and to equip students for conducting original research in their own areas of interest within this field. This course is designed for advanced political science graduate students preparing to commence their original research. Its orientation is theoretical rather than empirical, and includes both reading and research. (F.SP) Staff

225. Constructivism. (4) Three to four hours of seminar per week. Formerly 224B. This seminar traces the development of the constructivist program in international relations in order to better understand its elements, assumptions, and methods and apply those to current issues. We start by uncovering the roots of constructivism in sociology and philosophy and examine foundations in the English School, world systems theory, regime theory, and sociological institutionalism. The second part of the course focuses on the constructivist agenda in international relations, its boundaries and its critics. In the last part of the course, we examine current research in international relations that draws on sociological methods, including work on the role of norms, epistemic communities, transnational civil society, and the origins of the state. (F.SP) Hassner

225A. The Empirical Analysis of International Security. (4) Four hours of lecture per week. This course offers an introduction to the empirical analysis of international security. The primary goals are: (1) to acquaint students with the mathematical techniques that are used to test hypotheses about the security behavior of states, (2) to develop a critical understanding of the field of international security that has been produced with quantitative approaches, and (3) to teach students how to conduct original research in this field. In the first part of the course, we examine current research in international relations that draws on sociological methods, including work on the role of norms, epistemic communities, transnational civil society, and the origins of the state. (F.SP) Hassner

226A. International Political Economy. (4) Three hours of lecture per week. Prerequisites: Introductory courses (graduate or undergraduate) in international relations, foreign policy, international organizations, and political economy. The creation, maintenance, transformation, and decay of international arrangements designed to manage or regulate interstate relations, foreign policy, international organizations, and transnational civil society, and the origins of the state. (F.SP) Hassner

227A. Political Economics. (3) Two hours of lecture per week. Tools of political economics: preferences and institutions, electoral competition, agency, partisan politics. Redistributive politics: general interest politics, special interest politics. Comparative politics: electoral rules, separation of powers, political regimes. Dynamic politics: fiscal policy, growth. Also listed as Economics C215A. (F.SP) Staff

227B. Political Economics. (3) Two hours of lecture per week. Prerequisites: C237A and Economics 215A. Two hours of lecture per week. Topics from multi-equation causal modeling and introductory econometrics, with special emphasis on procedures appropriate for political data, including survey data.

230. Essential Methodological Tools. (4) Course may be repeated for credit. Three to four hours of lecture and one to two hours of discussion per week. Prerequisites: Open only to graduate students. Consent of instructor and graduate adviser. This course presents essential methodological concepts, ideas, and tools students need to know before beginning their study of the formal and quantitative methods tools used in political science research. Topics covered include functions, limits, continuity, calculus, optimization, probability and statistics, and linear algebra. Emphasis is devoted to concept of intervals, linear approximations, and integration. The course clearly cannot provide an equally comprehensive treatment. Rather, the class selectively focuses on those concepts and methods most commonly used in applied formal and quantitative work in political science. The goal of the course is to ensure that students have a sufficiently firm understanding of these concepts so that subsequent methods courses can build on the foundation. (F.SP) Staff

231A. Quantitative Analysis in Political Research. (4) Four hours of seminar and one hour of discussion per week. Prerequisites: 132A-132B or Statistics 130A. This course is an introduction to the course in the analysis of political data. (F.SP) Staff

231B. Quantitative Analysis in Political Research. (4) Three hours of seminar per week. Prerequisites: 231A or equivalent. Topics from multi-equation causal modeling and introductory econometrics, with special emphasis on procedures appropriate for political data, including survey data.

232A-232B. Formal Models of Political Science. (4) Three hours of seminar per week. Formerly 232. A. Mathematical models of politics with applications to political learning, bargaining, and democratic theory. Topics from game theory, collective choice theory, and mathematical economics. (F,SP) Staff

233. Psychometric and Econometric Methods. (4) Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

234A. Qualitative and Multi-Method Research. (4) Three hours of seminar per week.Prerequisites: Consent of instructor. This course will provide students with an introduction to the main concepts of qualitative research as well as an understanding of different statistical techniques but does not teach statistical methods. Basic data collection techniques. Approaches to data analysis. Provides an overview of different statistical techniques but does not teach statistics per se.

235. Introduction to Research Methods. (4) Three hours of seminar per week. Overview of methods of political research. Theories, concepts, variables, hypotheses, Research design, quantitative and qualitative methodology. Basic data collection techniques. Approaches to data analysis. Provides an overview of different statistical techniques but does not teach statistics per se.

236. The Statistics of Causal Inference in the Social Sciences. (4) Three to four hours of lecture per week. Prerequisites: One multivariate regression course. Approaches to causal inference using the potential outcomes framework. Covers observational studies with and without ignorable treatment assignment, randomized experiments with and without noncompliance, instrumental variables, regression discontinuity, sensitivity analysis, and random assignment. Applications are drawn from a variety of fields including political science, economics, sociology, public health, and medicine. (F.SP) Sekhon

C236A. The Statistics of Causal Inference in the Social Science. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: C236A or STAT 215A or equivalent. A seminar on successful research designs and a forum for students to discuss the research methods needed in their own work, supplemented by lectures on relevant statistical and computational topics such as matching methods, instrumental variables, sensitivity analysis, Bayes and Bayesian, maximum likelihood and robust estimation. Applications are drawn from political science, economics, sociology, and public health. Experience with R is assumed. (F.SP)

C237A. Political Economics. (3) Two hours of lecture per week. Tools of political economics: preferences and institutions, electoral competition, agency, partisan politics. Redistributive politics: general interest politics, special interest politics. Comparative politics: electoral rules, separation of powers, political regimes. Dynamic politics: fiscal policy, growth. Also listed as Economics C215A. (F.SP) Staff

C237B. Political Economics. (3) Two hours of lecture per week. Prerequisites: C237A and Economics 215A. Two hours of lecture per week. Topics from multi-equation causal modeling and introductory econometrics, with special emphasis on procedures appropriate for political data, including survey data.

239. Selected Topics in Methodology. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

239T. An Introduction to Computational Tools and Techniques for Social Science Research. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student standing. This course will introduce students with necessary technology skills for the political science methods curriculum. It will introduce students to both the software programs and the basic computational skills in data analysis and programing skills that will need to be successful in further methods work. This course is not an introduction to statistics. Some familiarity with basic statistics or linear regression may be helpful but is not expected or required. (F.SP)
243B. Political Authority and Economic Exchange in East Asia. (4) Three hours of seminar per week. This course will compare how authority and exchange relations are combined to regulate political and economic actions. South Korea, North Korea, Japan, and China. The course will examine theoretical literature on state-society relations, market, world system, late development, as well as empirical case studies drawn from contemporary China. (F,SP)

243C. Japanese Politics. (4) Three hours of seminar per week. Japanese domestic politics—issues in historical development; political bureaucratic and legal structures; studies in economic policymaking. (F,SP)

243D. Proseminar on Modern Korean Politics and Society. (4) Two to three hours of seminar per week. Prerequisite: Consent of Instructor. This proseminar on modern Korean politics will critically review major English and Korean social science literature covering all major political events in modern Korea. Korea’s history has been filled with turbulent but unique experiences: initial failed efforts at modernization; experiences with Japanese colonialism; tragic, externally imposed division and civil war; drastically divergent nation-building experiences between South and North; and the formidable task of eventually unifying a divided country. These qualities have made Korea a fascinating social science laboratory in which questions crucial to many urgent contemporary theoretical debates can be explored. This class will examine Korea’s experiences from the perspective of various social science theories and encompass a comparative consideration of Korea and Japan as well as South and North Korea. This class will make an extra effort to identify how and to what extent one can identify cultural continuity and discontinuity in the modern experiences of the two Koras. (F,SP)

244A. Analysis of Contemporary China. (4) Three hours of seminar per week. This is the first in a two-semester sequence designed to provide the incoming graduate student with a basic grounding in the politics of contemporary China. The focus will be on wide reading and comprehension of the available analytical literature; its sequel will be devoted to integrating that reading with primary source research materials. There are no prerequisites, though undergraduate course work in Chinese politics and/or some acquaintance with the Chinese language would be useful. (F,SP)

244C. Approaches to Chinese Politics. (4) Two hours of seminar per week with an additional hour to be arranged with instructor. This course has three main objectives: (1) to expose students to debates in the study of contemporary Chinese politics; (2) to consider how research on contemporary China both draws from and informs political science; and (3) to explore characterizations of the Chinese state and state-society relations. Questions such as: What can we learn by examining Chinese culture and institutions? Do concepts such as fragmented authoritarianism, neotraditionalism, state “reach,” civil society, and corporatism produce insights into the structure and dynamics of Chinese politics? (F,SP)

244D. Collective Action in China. (4) Two hours of seminar per week with an additional hour to be arranged with instructor. This course will explore contentious politics in the People’s Republic of China. Special attention will be given to the current era and dissent by peasants, migrants, workers, religious groups, women, students, artists, and dissidents. How do concepts drawn from social movement theory help us understand popular activism? What are the consequences of these events for regime stability and the development of a more open citizenship? (F,SP)

244E. The Political Economy of China. (4) Three hours of seminar per week. This course will examine the interrelationships between politics and the economy in contemporary China. How has China achieved rapid economic growth when basic market institutions are missing or deeply corrupted? How have China’s leaders managed to keep economic development from leading to democratic demands? Does China’s experience hold lessons for other developing countries? (F,SP)

245A. South Asian Politics. (4) Three hours of seminar per week. Major themes of politics and international relations in India, Pakistan, Burma, and the mountain kingdoms of Nepal, Bhutan, and Tibet. (F)

245B. International Relations in East Asia. (4) Two to three hours of seminar per week. This seminar will focus on postwar relations among the countries in East Asia. Asia was long divided by colonialism, the Cold War, and American “isolationist” policies. (F,SP)

245C. Comparative Politics in Asia. (4) Three hours of lecture per week. Comparative politics has tended to emphasize Asian political comparisons from a comparative perspective. Course requirements focus on intensive and extensive reading, as indicated by a series of brief comparative review-essays and lively class discussions. No formal course prerequisites. (F,SP)

246. African Politics. (4) Three hours of seminar per week. Politics of Sub-Saharan Africa; relations of state and society in the context of weak states; state building; societal pluralism; the political role of ethnicity; crisis states and proto-national states; ethnic states; oppression and resistance/civil conflict and class formation; political order and development; modernization and equity; and interstate conflict and international order. (F,SP)

246B. Ethnic Politics. (4) Four hours of seminar per week. This graduate seminar is designed to introduce students to the comparative study of ethnic politics. It provides an overview of theoretical questions and methodological innovations across five topics: (1) the conceptualization and measurement of ethnicity; (2) the sources, extent, and dimensions of ethno-political violence ranging from urban riots to civil wars. Readings for each topic are drawn from various political science subfields as well as from other disciplines. They also reflect a contrast between the Global North, including Eastern Europe, South Asia, and Sub-Saharan Africa. The purpose of the course is to provide graduate students with a basis for undertaking their own original research on questions studied within this field. It should enable them to critically engage recent scholarship, understanding which theories have yet to be adequately tested and which theoretically interesting questions have yet to be asked. (F,SP)

247A. Western European Politics. (4) Three hours of seminar per week. Major themes of politics and international relations of Western Europe. (F)

247G. The Comparative Politics of the Welfare State. (4) Three to four hours of lecture per week. This course analyzes the politics of social protection in Western Europe and the United States. After describing different national welfare regimes, we turn to contemporary challenges, notably globalization, persistent poverty, and changes in family forms and gender roles. We also look at the politics of welfare reform and adjustment, paying particular attention to the prospects for progressive social policy. Must reform inevitably scale back protections for the weak and vulnerable, or can equity be safeguarded while promoting efficiency? (F,SP)

248A. Latin American Politics. (4) Either part of the 248A-248B sequence may be taken separately for credit. Three hours of seminar per week. Explores different analytical approaches to Latin American politics, focusing both on major concepts (clientelism, corporatism, the state, legitimacy, nationalism) and different explanatory approaches (focusing on factors such as dependency and imperialism, internal social forces, and economic changes; political structure and institutions and political culture). (F,SP)

249. Special Topics in Area Studies. Four hours of lecture per week. Visit department website for specific course offerings. (F,SP)

Public Law and Jurisprudence

252. Legal Theory and Institutions. (4) Three hours of seminar per week. The organization and behavior of legal institutions, with particular reference to American courts and administrative agencies. Institutional responses to problems of legitimacy, authority, policy choice, and the organization of enforcement and decision-making processes. Readings include empirical studies, judicial opinions, jurisprudential writings and organization theory. (F,SP)

257. Constitutional Law. (4) Three hours of seminar per week. Fundamental principles of constitutional law, leading cases, judicial decisions affecting the liabilities, rights, duties and procedures of governmental officers and agencies, causes and consequences of legal decision, judicial behavior. (F,SP)

259. Selected Topics in Public law. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

Political Behavior

261. Political Behavior. (4) Three hours of seminar per week. A comprehensive review of the major topics in political behavior through intensive exploration of the theories, findings, and proceedings of the most significant studies in the field. (F)

262. Voting Behavior and Public Opinion. (4) Three hours of seminar per week. Examination of the basic literature on American voting behavior, public opinion and student research on individually selected topics in this field. (F)

263. Mass Politics in Advanced Industrial Democracies. (4) Three hours of seminar per week. Theories and evidence concerning political conflict in advanced industrial societies. The empirical focus is on mass politics: the beliefs, attitudes, and behaviors of ordinary citizens rather than of activists or elites. The principal theoretical focus is on how changes in social structure, culture, and political institutions influence patterns of political cleavages. It should enable comparative analysis, with attention to the issue of American exceptionalism versus cultural and policy convergence. (F)

269. Selected Topics in Political Behavior. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

American Government and Politics

271. American Government and Political Field Seminar. (4) Three hours of seminar per week. This seminar is designed to acquaint students with current research approaches in various subfields of American politics. Particular attention will be given to debates over theory, methodology, and substance. The seminar is not designed to provide a complete survey of the field. Students planning to be examined in American politics are expected to master recommended readings on their own and should review additional readings included in versions of this seminar offered in the past years. (F,SP)

271A-271B. American Government. (4) Four hours of seminar per week. Credit and grade to be awarded based on performance. This course covers major topics in American national politics, including public opinion, elections, parties, interest groups, Congress, the presidency, the bureaucracy, and policy information. (F)

272A-272B. National Policy Making. (4) Three hours of seminar per week. Credit and grade to be
awarded on completion of sequence. Formerly 272. National policy-making processes, concentration on congress, the Presidency, and interactions among policy-making institutions.

273. Urban Politics. (4) Three hours of seminar per week. Politics and policy-making in American cities. Historical, economic, and social context of cities. Major urban political institutions, other levels of government in urban affairs.

274. American Political Development. (4) Three hours of seminar per week. Political and policy-making in American politics. The objective is to extract the central conditions, processes, and controversies that have formed American political development and try to come to terms with possible reasons among them.

276. Race, Immigration, and Identity in United States Politics. (4) Course may be repeated for credit with a different instructor. Three hours of seminar per week. The goal of this course is to explore, discuss, and better understand the relationship between perceptions of racial identity, attributions of racial difference, and politics, broadly defined. It focuses on recent and contemporaneous intersections of race, immigration, and identity politics in the United States. While much of the readings come from quantitative studies of political behavior, students are expected to grapple especially with parallel debates in philosophy, psychology, sociology, economics, and history. (F,SP) Lee, Taeku

279. Selected Topics in American Government. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Consent of instructor. See department announcements. Topic will vary with instructor.

Public Organization Administration and Policy

280A. Public Organization Theory. (4) Three hours of seminar per week. A survey of the literature of organization and management theory, emphasizing the major writers and distinctive contributions of various disciplines.

280C. Politics and Organization. (4) Three hours of seminar per week. A process of public policy formulation, governmental planning and programming, and administrative decision making. Staff

281A. Budgeting. (4) Three hours of seminar per week. Budgeting in diverse contexts—from ancient to modern times, local, state and national government, and in rich countries. Topics include budget theory, strategies and calculations, program budgeting, state power and financial capability, decentralization, diffusion of financial norms and technologies, and the politics of financial oversight. Staff

284. Strategies of Contemporary Governance. (4) Two to three hours of seminar per week. This course explores the implications of new strategies for coping with social problems and managing public programs. In response to growing criticism of government bureaucracy, public skepticism of expert authority, and an explosion of advocacy groups, a variety of new governance strategies have been developed. These new strategies are characterized by five broad themes: (1) the use of markets or market mechanisms to increase efficiency; (2) an emphasis on holding public agencies accountable and making them more transparent; (3) the development of coordinating networks among agencies with each other and with stakeholders; (4) the extensive involvement of non-state organizations in all aspects of governing; and (5) renewed attention to the civic role of individuals and political engagement by ordinary citizens. Students will analyze the new strategies in making the governance process more efficient, accountable, effective, representative, and civic. (F,SP) Ansell

287. Development Administration. (4) Three hours of seminar per week. The problems of administering economic development programs in poor societies. Particular emphasis is placed on rural development, the problems of relating bureaucratic structures to peasant communities, and the relevance of organization theory to non-Western administration.

289. Research Topics in Public Organization. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. See department announcements. (F,SP)

Special Studies

290. Dissertation Research. (4) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Seminar to aid students in initiating, carrying out, and completing dissertation research. Problems of planning dissertation and preparation of research designs and proposals for outside funding, fieldwork, and writing and presenting the results of completed research. Presentations by graduate students working on their dissertation (second year or above). A forum for the presentation and discussion of research in progress by graduate students. To receive credit for the course, the student will make at least one presentation of work in progress per semester and to serve as a discussant for another student's work. Appropriate works-in-progress include, but are not limited to, a paper in preparation for submission to a journal, a dissertation prospectus (including early drafts), a dissertation chapter, or a job market paper. Anyone working on theory is welcome. (F,SP)

291. Research Workshop in American Politics. (1-2) Course may be repeated for credit. Two to three hours of directed group study per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student standing (second year or above). A forum for the presentation and discussion of research in progress by graduate students (second year and above). To receive credit for the course, the student will make at least one presentation of work in progress per semester and to serve as a discussant for another student's work. Appropriate works-in-progress include, but are not limited to, a paper in preparation for submission to a journal, a dissertation prospectus (including early drafts), a dissertation chapter, or a job market paper. Anyone working on theory is welcome. (F,SP)

292. Directed Advanced Study. (2-12) Course may be repeated for credit. By arrangement with faculty. Prerequisites: Consent of instructor and graduate adviser. Open to qualified graduate students wishing to pursue special study and research under direction of a member of the staff. (F,SP)

296. Directed Dissertation Research. (4-12) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Open to qualified students advanced to candidacy for the Ph.D. degree.

299. Independent Study in Preparation for the M.A. Essay. (4-8) Credit to be awarded on completion of the master's essay. Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Open only to qualified first-year graduate students working toward the M.A. degree.

602. Individual Study for Doctoral Students. (4-12) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Independent study in consultation with the major field adviser, intended to provide opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree.

Professional Courses

301. Graduate Student Instructor Training Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Seminar open to students engaged in supervised research under the direction of a staff member with emphasis on the teaching of undergraduate courses in political science.

398. Professional Preparation for Graduate Student Instructors. (4) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Special study under the direction of a staff member with emphasis on the teaching of undergraduate courses in political science.

404. Research Skills. (1-4) Course may be repeated for credit. By arrangement with faculty. Must be taken on a satisfactory/unsatisfactory basis. Special study under the direction of a staff member with emphasis on the teaching of undergraduate courses in political science.
Psychology
(2011-12)

Department Office: 3210 Tolman Hall, (510) 642-5292
psychology.berkeley.edu

Chair: Stephen Hsinshaw, Ph.D.

Professors

Joseph J. Campos, Ph.D. Cornell University. Social/emotional development of infants; perceptual development

Mark D. Eipperle, M.D. State University of New York, Syracuse. College of Medicine. Working memory and frontal function, functional MRI, cognitive neuroscience

Jack Gaitani, Ph.D. Yale University. Visual neuroscience, attention, spatial vision, brain connectivity; cognitive neuroscience

Alison Gopnik, Ph.D. Oxford University. Cognitive and language development, children's theories of mind, cognitive and psychological development

Allison Harvey, Ph.D. University of New South Wales, Australia. Adult psychopathology; sleep disorders; cognitive processes of Broughton, attention, memory, and reasoning

Stephen Hirstaw (Chair). Ph.D. University of California, Los Angeles. Clinical child psychology, developmental psychology, statistics related to mental illness

Richard Irivy, Ph.D. University of Oregon. Cognition and action, human performance and skill acquisition, cognitive neuroscience

Oliver P. John, Ph.D. University of Oregon. Self-concept, self-perception: accuracy and biases, personality development across the life span

Sheri L. Johnson, Ph.D. University of Pittsburgh. Bipolar disorders; neurobiological, cognitive, emotional, and social triggers of mania

Dacher Keltner, Ph.D. Stanford University. Emotion, individual differences in emotion; social interaction; conflict and negotiation; culture

John Kiltsch, Ph.D. University of Pennsylvania. Cognition in personal and social contexts, unconscious mental processes, memory, hypnosis

Robert Knight, M.D. Northwestern University. Attention and memory, memory systems and cognitive neuroscience

Ann King, Ph.D. State University of New York, Stony Brook. Schizophrenia, emotionality, gender and emotion

Robert W. Levenson, Ph.D. Vanderbilt University. Human psychopathology, on-line aging, and marriage

Mary B. Main, Ph.D. Johns Hopkins University. Attachment; social relationships in early childhood; the development of twins

Jonas Langer, Ph.D. Stanford University. Cognitive and language development, infant cognition

Arthur Shimamura, Ph.D. University of Washington. Cognitive neuroscience, frontal lobe function, memory, and emotion

Fredric Theunissen, Ph.D. University of California, Berkeley. Neural basis of vocal learning in songbirds, auditory physiology

Thomas Wickens, Ph.D. Brown University. Mathematical models of perception and judgment, statistics and experimental design

Fei Xu, Ph.D. Georgia Institute of Technology. Cognitive and language development, infant cognition, statistical inference, word learning

*Martin V. Covington (Emeritus), Ph.D.
*Philipp E. Cowan (Emeritus), Ph.D.
*Kenneth H. Covarrubias (Emeritus), Ph.D.
*Karen K. DeValois (Emeritus), Ph.D.
*Susan Ervin-Tripp (Emeritus), Ph.D.
*Stephen E. Glickman (Emeritus), Ph.D.
*Harmon G. Gough (Emeritus), Ph.D.
*Evrin R. Hafter (Emeritus), Ph.D.

Associate Professors

Ozlem Ayduk, Ph.D. Columbia University. Cognitive and affective processing in close relationships; self-regulation of violence, hostility, and depression; processes in regulating affect

Silvia Bunge, Ph.D. Stanford University. Cognitive neuroscience, computational cognitive neuroscience, cognitive and prefrontal function

Serenia Chen, Ph.D. New York University. Relationship cognition, representation of self and identity, social power, intergroup relations

Thomas Clegg, Ph.D. Stanford University. Computational models of cognition (causality, categorization, inductive inference, probabilistic reasoning, language learning and evolution); machine learning

Carla Hudson Kam, Ph.D. University of Rochester. First- and second-language acquisition, how these processes constrain the form of languages, how languages change over time

Luzia Jacobs, Ph.D. Princeton University. Evolution and ecology of learning

Lance Kliegel, Ph.D. Johns Hopkins University. Behavioral neuroendocrinology, circadian biology, reproductive behavior and physiology

Rodolfo Mendoza-Denton, Ph.D. Columbia University. Prejudice, stereotyping, cultural influences on social cognition

Kapilip Peng, Ph.D. University of Michigan. Cultural psychology, reasoning and judgment across cultures, cognitive appraisals

Matthew Walker (WFC Fellowship), Ph.D. University of Newcastle. Sleep and learning, brain plasticity, emotion regulation

Jonathan Wallas, Ph.D. University of Cambridge. The role of the prefrontal cortex in the organization and control of goal-directed behavior

David Whitney, Ph.D. Harvard University. Visual perception, sensation/perception

Assistant Professors

Sonia Bishop, Ph.D. King's College London. Cognitive and affective neuroscience; genetic influences on the neural basis of psychopathology

Tania Lombrozo, Ph.D. Harvard University. Cognitive psychology of explanation and understanding; concepts, theories, and causality; moral reasoning; philosophy and psychology

Qing Zhu, Ph.D. Arizona State University. Developmental psychological anthropology; the roles of temperament, emotional regulation, and family socialization in child and adolescent development; cultural influences on socio-emotional development

Adjunct Professors

William Prinzelin, Ph.D. Claremont Graduate School. Visual perception, attention, cognition

Lynn Robertson, Ph.D. California, Berkeley. Representations of objects and space, visual search and feature binding mechanisms; attention and perceptual organization

Carolyn Faye Cowan (Emerita), Ph.D.

Ravena M. Hines (Emerita), Ph.D.

Adjunct Associate Professor

Erik Hesse, Ph.D. Leiden University. Attachment; narrative; education

Ammar S. McDonald, Ph.D. University of California, Berkeley. Neural basis of vocal learning in songbirds, auditory physiology

Erik Hesse, Ph.D. Leiden University. Attachment; narrative; education

Ravenna M. Hines (Emerita), Ph.D.

Affiliated Professors

Cameron Anderson (Organizational Behavior and Industrial Relations/Haas School of Business)

Martin Banks (Optometry)

Jack Glaser (Public Policy)

Lynn Robertson (Caltech, Psychology)

Caryn Pape Cowan (Emerita), Ph.D.

Ravena M. Hines (Emerita), Ph.D.

Michael A. Ranney (Education)

William McKinney (Social Work)

Michael Silver (Optometry)

Lorne Snowden (Public Welfare)

Phil Tzelgov (Psychology and Industrial Relations/Haas School of Business)

Eloit Turel (Education)

David Wessel (Music)

Department Overview

Psychology represents an extremely broad discipline, ranging from the study of behavior of the simplest of organisms to the behavior of humans and groups of humans in complicated situations. Its levels of analysis span cells, brains, individuals, families, communities, and other large social groups. The psychology major gives basic, well-rounded coverage of most of the principal subfields in the broad field of psychology. The areas covered include social, developmental, behavioral neuroscience, comparative, industrial, clinical, and cognitive psychology, as well as learning (human and animal), perception, personality, and psycho-linguistics. The fact that psychology is so diverse means, however, that all areas of study cannot be represented within the expertise or primary interest of a single student. Therefore, students preparing for careers in psychology will need to choose an area in which they can becomesting specialists, whether for the sake of their work or for the purpose of obtaining a well-rounded education.

Examinations

Admission to the major is not guaranteed. Applicants may still be admitted to the major; however, admission to the major is not guaranteed. Applicants will be admitted only if they have completed all prerequisites and have submitted all required materials within the application deadline.

Preparatory Courses (12 total courses):

Psychology 1, AP Psychology with a score of 4 or 5 will satisfy this requirement.

Biology 1 and 2, AP Biology with a score of 4 or 5 will satisfy one of these requirements; the other social science course may not be in political science.

Biology 1 and 2, AP Biology with a score of 4 or 5 will satisfy one of these requirements; the other social science course may not be in political science.

Biology 1 and 2, AP Biology with a score of 4 or 5 will satisfy one of these requirements; the other social science course may not be in political science.

Preparatory Courses (7 total courses):

Psychology 1, AP Psychology with a score of 4 or 5 will satisfy this requirement.

Evolution: One course from Molecular and Cell Biology 41 or 41X; Anthropology 1; Integrative Biology 35AC.

Biological science: Two courses from Molecular and Cell Biology 31, 32, 50, 61, 64; Biology 1A, 1B, 11; Integrative Biology 31, (AP Biology with a score of 4 or 5 will satisfy one of the biological sciences prerequisites).

Social science: Two courses from Anthropology 3 or 3AC; Sociology 3 or 3AC; Linguistics 5; Political Science 1, 4 or 11; One of the two courses must be from different departments (AP US Government or AP Comparative Government with a score of 4 or 5 will satisfy one of these requirements; the other social science course may not be in political science).

Quantitative: One course from Statistics 2, 20, or 21; Math 54 or 55. (AP Statistics with a score of 4 or 5 will satisfy this prerequisite.)

Upper Division Requirements (8 total courses):

Research design and methods: Psychology 101. (We strongly recommend that this course be taken as soon as possible once a student is admitted to the major.)

Three decade courses: Select three courses from Psychology 110, 120, 130, 140, 150, 160, and 180.

Four elective courses: Select four upper-division psychology courses numbered 104-182 and, with approval, Psychology 192. Psychology 192 is reserved for new courses and may be taken multiple times, up to a maximum of four. These courses can apply toward one or more electives. Note: Psychology H194A-B, H195A-B, 187, 198, and 199 do not count toward the course requirement. Any excess credits may count towards electives.
Breadth: The seven upper division courses offered in psychology (including the special topics courses) are designed to provide students with breadth in the field. Students will have the opportunity to explore various subfields of psychology, such as cognitive, brain, and behavior (110-129); developmental (140-149); and social/personality (150-169, 180).

Note: All courses (both prerequisites and upper division) must be taken for a letter grade.

Honors Program. Admission to the Honors Program is limited to senior psychology majors who have a 3.5 GPA in the psychology major and a cumulative GPA of 3.3. Students complete Psychology 191SA and 191SB (Honors Thesis) under the supervision of a psychology faculty member. Honors students are encouraged to begin this process well before their senior year. Honors students are encouraged to take Psychology H194A and H194B (Honors Seminar). Evaluation of the thesis is the responsibility of the faculty adviser and the second faculty reader as assigned by the chair of the department. Additional information can be found on the website at psychology.berkeley.edu.

Research Experience. All majors are encouraged to gain hands-on research experience. Research opportunities are listed outside the Student Services office in Tolman Hall. Students are also encouraged to contact the graduate student services adviser at Admissions.

For graduate work, it is essential that students considering psychology or a cognate field as the best preparation about the graduate program and admissions, which are available on the website at psychology.berkeley.edu.

The online Schedule of Classes offered prior to each semester and the department course descriptions included in the beginning of each year will contain more detailed and up-to-date information about courses offered by the Department of Psychology. Consult these sources for current course offerings.

Graduate Study

Preparation. The Department of Psychology regards completion of an undergraduate major in psychology or a cognate field as the best preparation for graduate study. In addition to coursework, it is essential that students considering graduate work in psychology become involved in research during their undergraduate studies, and/or following the undergraduate degree. The number of qualified applicants greatly exceeds the number admitted. Prospective applicants who have little or no background in psychology or research will have to seek such training prior to applying for graduate work.

Admissions. The graduate program is designed for doctoral students interested in pursuing advanced study and conducting original research in psychology. New admissions are restricted to candidates for the Ph.D. program. Students are accepted for the first time in the fall semester. Detailed information concerning admission, financial aid, and degree requirements is available at psychology.berkeley.edu.

The graduate admission application can be completed online at psychology.berkeley.edu. For more information about the graduate program and admissions, contact the graduate student services adviser at psychgradinfo@berkeley.edu or (510) 642-1382.

Graduate Training Programs. Graduate training is organized around five major areas of study. Formal graduate training, including the selection and evaluation of students and the development and maintenance of training programs, is the primary responsibility of faculty members in the following areas: (1) behavioral neuroscience; (2) change, plasticity, and development; (3) clinical science; (4) cognition, brain, and behavior; and (5) social/personality. A mission statement and information on program requirements for each of these areas can be found on the department website at psychology.berkeley.edu/graduate. Graduate students complete a core set of department-wide courses (statistics, professional development, teaching, preparation, area-based programming) seminars (usually “decade” numbered, e.g., 210, 220, 230, etc.), and specialized seminars. All students are expected to be engaged in research throughout their graduate studies, through participation in the Graduate Research Apprenticeship Program (GRAP) and/or other requirements. Students are required to serve in at least two semesters as a graduate student in the department (210, 220, 230, etc.), and seek such training prior to applying for doctoral study. In order to be eligible for the Ph.D. degree, all requirements of all programs consist of the successful passing of the qualifying examination, usually taken during the third year, and the submission and approval of the dissertation.

General Psychology

Further Information. The online Schedule of Classes offered prior to each semester and the department course descriptions included in the beginning of each year will contain more detailed and up-to-date information about courses offered by the Department of Psychology. Consult these sources for current course offerings.

Lower Division Courses

1. General Psychology. (3) Students will not receive credit for 1 after taking 2. Two hours of lecture and one hour of discussion per week. Introduction to the principal areas, problems, and concepts of psychology. This course is required for the major; students not considering a psychology major are directed to 2. (F,SP)

2. Principles of Psychology. (3) Students will not receive credit for 2 after taking 1. Three hours of lecture per week. Students will be required to take 1 or consent of instructor. This course is required for the major; students not majoring in the field. This course satisfies the requirement for upper-division division courses. (F,SP)

3. Psychology of Gender. (3) Three hours of lecture per week. Examination of various factors in the development of feminine and masculine roles, including personality, social processes, biology, and culture.

4. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a Pass/No Pass basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP)

39A. Unnatural Causes: Is Inequality Making Us Sick? (3) Students will receive no credit for 39A after taking 39J. Three hours of seminar per week in this interdisciplinary seminar will explore the large and disturbing socioeconomic and racial/ethnic disparities in health. The seminar will cover the social circumstances in which we are born, live, and work and how we are “biologically embedded” and put us at risk for stroke, heart disease, poor mental health, and academic achievement. This seminar will explore the damaging effects of stressful life events on health and well-being. Specific attention will be focused on how children’s experiences within and beyond their families affect their development, the role of inequality, racism, and neglect in health and development, and the role of inequality, racism, and neglect in health and development. The seminar will cover the biological and social mechanisms that underlie these effects and how these mechanisms may be transmitted across generations. (F,SP)

98. Supervised Group Study. (1-3) Course may be repeated for credit. One to three hours of directed group study per week. Must be taken on a pass/no pass basis. Group study of selected topics. Enrollment restricted. See the Introduction to Courses and Curriculum section of this catalog. (F,SP)
sideration of history of particular subject areas—such as biological, comparative, developmental, personal- ity, and social psychology as well as general trends.

**Biological Psychology**

110. Introduction to Biological Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 and biological prerequisites for the major or consent of instructor. Survey of relations between biological psychology and behavior. Topics include sensory and perceptual processes, neural maturation, natural bases of motivation, and learning. (F,SP)

111. Sensory Processes. Vision. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 110 or consent of instructor. Examination of various aspects of visual perception—adaptation, brightness and color vision, binocular vision, object detection—in relation to anatomy and physiology of the visual system.

C112. The Biology of Stress. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 110 or Biology 1A. This is an upper-division undergraduate course designed to explore the impact of stress—as a product of genes, environment, hormones—on brain and behavior. It will adopt both a multidisciplinary and a transdisciplinary approach to the concept of stress. What is stress? How is it measured? What are differences between acute and chronic stress? How can physiological control mechanisms on the brain? How does stress affect gene expression or neurogenesis? What are the relationships between stress and disease? All of these questions will be addressed in this course. Also listed as Integrative Biology C139.

C113. Biological Clocks: Physiology and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of biological prerequisites for the major and one of the following: 110 or a course in animal organismal physiology (Integrative Biology 132, 140, 148, or Molecular and Cell Biology 160). A consideration of the biological clocks that generate daily, lunar, seasonal and annual rhythms in various animals including people, emphasizing on neuroendocrine substrates, development and adaptive significance of estrous cycles, feeding rhythms, sleep-wakefulness cycles, reproductive and hibernation cycles, body weight, and migratory cycles. Also listed as Integrative Biology C143A.

114. Biology of Learning and Neural Plasticity. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 110 or consent of the instructor. A study of theoretical and experimental investigations of the biological substrates of learning, memory, and forms of neural plasticity related to the growth and maturation of the nervous system.

C116. Hormones and Behavior. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Completion of biological prerequisites for the major and consent of instructor; a course in mammalian physiology recommended. This course provides a comprehensive overview of behavioral endocrinology, focusing on hormone production and actions on target tissues and continuing with an exploration of a variety of behaviors and their hormonal regulation/consequences. The course uses a comparative approach, the reciprocal actions between the neuroendocrine system and behavior, considering the effects of hormones on development and adult behavior in addition to how behavior regulates endocrinology. While most of the course focuses on non-human vertebrate species, the relevance to humans is explored where appropriate. Topics include sexual differentiation and sex differences in behavior, reproductive, parental, and aggressive behaviors and their hormonal and behavioral homeostatic regulation. Also listed as Integrative Biology C143B.

117. Human Neuropsychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 or consent of instructor. Critical problems in approaches to problems of human disabilities including mental disorders, behavior changes following human brain injury and disease, and mental subnor- mality. Emphasis on nervous system models of these problems and areas of potential application of basic research development. (F,SP)

119. Drugs and Behavior. (3) Students will receive no credit for 119 after taking Letters and Science 19 or Molecular and Cell Biology 19. Two hours of lecture and one hour of discussion per week. Prerequisites: 110 or consent of instructor. A survey course exploring the basic principles of psychopharmacology. The course will cover the major actions of drugs and their relevance to humans is explored where appropriate. Emphasis will be placed on effects of pharmacological agents on complex mental processes such as attention, motivation, learning, and memory.

**Cognitive Psychology**

C120. Basic Issues in Cognition. (3) Students will receive no credit for C120 after taking 120A. Two hours of lecture and one hour of discussion per week. This theoretical foundations and current controversies in cognitive science will be discussed. Basic issues in cognition—including perception, imagery, memory, categorization, thinking, judgment, and development—will be considered from the perspectives of philosophy, psychology, computer science, and biology. Particular emphasis will be placed on the nature, implications, and limitations of models of mind. Also listed as Cognitive Science C100. (F)

121. Animal Cognition. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 115B or consent of instructor. This course focuses on how animals process, organize, and retain information. Topics will include sensory processes, navigation and migration, communication, and cross-species comparisons of behavior. Material will be drawn from the ethological, behavioral/experimental, and, to a lesser extent, the neurosciences literature.

122. Introduction to Human Learning and Memory. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 101 is recommended. Theoretical and experimental analysis of human learning and memory, particularly long-term memory: coding and retrieval processes; transfer and interference; mechanisms of forgetting.

C123. Computational Models of Cognition. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Calculus, discrete mathematics, Cognitive Science C1, Computer Science 61A, or equivalents. This course will provide advanced students in cognitive science and computer science with the skills to develop computational models of human cognitive capacities into how people solve challenging computational problems, as well as how to bring computers closer to human performance. The course will explore three ways in which researchers have attempted to model psychological processes, approaches, neural networks, and probability and statistics—considering the strengths and weaknesses of each. Also listed as Cognitive Science C131.

C124. Psycholinguistics. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: An introductory course in linguistics or consent of instructor. Introduction to psycholinguistics, emphasizing effects of psychological variables on the learn- ing and use of language. Includes a consideration of the relationship between theories of language learning and psychological processes; and special attention to psychological applicability of modern linguistic theory and to social psychological aspects of language behavior. Also listed as Cognitive Science C124.

125. The Developing Brain. (3) Students will receive no credit for 125 after taking 192 (fall 2007). Two hours of lecture and one hour of discussion per week. Prerequisites: Cognitive neuroscience or human neuropsychology recommended or consent of instructor. What are the changes in brain structure and function that underlie improvements in cognitive abilities over childhood and adolescence? Or, coming from a dif- ferent perspective, what does the child learn regard- ing the neural basis of cognition by examining how the brain develops? And how are such findings relevant for medicine, education, and the law? The cutting-edge, new field of developmental cognitive neuroscience is beginning to address these and other questions. This course will constitute an overview of current research and methods, focusing on both typically and atypically developing children and adolescents.

C126. Perception. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. 101 recommended. An introduction to principles and theories of human perception. Topics will include psychophysics; perception of color, space, shape, and motion; pattern recognition and percep- tual attention. Also listed as Cognitive Science C126.

C127. Cognitive Neuroscience. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 110 or C120, or Cognitive Science C100 recommended. This course will examine research investigating the neurological basis of cognition. Material covered will include the study of brain-injured patients, neurophysiological research in animals, and the study of normal cognitive processes in humans with non-invasive behavioral and physiological technol- ogies such as functional Magnetic Resonance Imag- ing (fMRI), electroencephalography (EEG), and transcranial magnetic stimulation (TMS). Topics to be covered include perception, attention, memory, language, motor control, emotion, and decision making. Also listed as Cognitive Science C127.

128. Topical Seminars in Cognitive Psychology. (3) Course may be repeated for credit with different topic and consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. For a precise schedule of offerings check with the Student Services office each semester.

C129. Scientific Approaches to Consciousness. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1 or Cognitive Science C1, or consent of instructor. This course will examine the nature of human consciousness from the interdisciplinary perspective of cognitive science. It will cover topics from the philosophy of mind, cognitive linguistics, neuroscience, psychology, and computational models. Also listed as Cognitive Science C102.

**Clinical Psychology**

130. Clinical Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 130 or consent of instructor. This course will discuss linkages between developmental processes and child psychopathology. Included will be discussion of cognitive impairments in children, including learning disabilities and mental retardation; internalizing disorders, such as anxiety, withdrawal, and depression; externalizing disorders, such as attentional and conduct/behavioral difficulties; and child abuse and neglect. Psychological, familial, legal, and societal factors will be emphasized. (F,SP)

131. Developmental Psychopathology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 130 or consent of instructor. This course will focus on developmental processes and child psychopathology. Included will be discussion of cognitive impairments in children, including learning disabilities and mental retardation; internalizing disorders, such as anxiety, withdrawal, and depression; externalizing disorders, such as attentional and conduct/behavioral difficulties; and child abuse and neglect. Psychological, familial, legal, and societal factors will be emphasized. (F,SP)

132AC. Community Psychology: An American Cultures Perspective. (4) Two hours of lecture and one and one half hours of discussion per week. Prerequisites: 130 or consent of instructor. Introduction to community psychology with a comparative emphasis on ethnic cultural diversity. Critical examination of social constructs and the role of cultural factors that affect the development of mental health, and social/community intervention approaches that pre- vent dysfunction or promote competence for popula- tion specific communities. Theories and methods of community psychology as they apply to five ethnic-cultural groups: African Americans, Asian Americans, Chicano/Latinos, indigenous peoples
of the United States, and European Americans. Students participate in community-based action research projects. This course satisfies the American Cultures requirement.

133. Psychology of Sleep. (3) Two hours of lecture and one hour of discussion per week. This course has two primary goals: (1) to provide a basic introduction to the study of sleep and an overview of sleep measurement, regulation, ontogeny, phylogeny, physiology; and (2) to provide an introduction to sleep disorders including their classification, cause, and treatment. (F,SP) Staff

Developmental Psychology

140. Developmental Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 140. Cognitive, perceptual, and social development during the first two years of life with emphasis upon methods of observation and experimentation.

143. Language Acquisition. (3) Two hours of lecture and one hour of discussion per week. The course will provide children—‘How do children learn language?’—by examining classical and contemporary theories of language acquisition. Topics include early speech perception, word learning, the acquisition of phonology, morphology, syntax, and pragmatic knowledge. In addition, we will cover topics such as language development disorders (e.g., autism), the critical period hypothesis, sign language, creolization, bilingualism, and language and thought.

146. Developmental and Biological Processes in Attachment. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: 110 or consent of instructor. This course on attachment theory provides an integrative (evolutionary/genetic/ experiential) approach to studying secure versus insecure parent-child relationships; their precursors in parental rearing patterns and genetics; and their favorable versus less favorable psychological sequelae for children. Adult life-history narratives indicative of secure versus insecure adult attachment have been found associated with care-giving of offspring and change from insecure to secure adult attachment is discussed.

148. Topical Seminars in Developmental Psychology. (3) Course may be repeated for credit with different consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. For a precise schedule of offerings, check with the Student Services office each semester.

Personality Psychology

150. Psychology of Personality. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1. A consideration of general and systematic issues concerning human personality and an evaluation of major theories and points of view. (F,SP)

156. Human Emotion. (3) Two hours of lecture and one hour of discussion per week. This course will examine two different theoretical perspectives on emotion: (1) the differential emotions approach with its strong evolutionary grounding and (2) the social constructionist approach. Next, the course will investigate empirical research on many facets of emotion including facial expression, physiology, appraisal, and their roles in social behavior. Finally, we will cover more specific topics including social interaction, culture, gender, personality, and psychopathology.

158. Topical Seminars in Personality. (3) Course may be repeated for credit with different topic and consent of instructor. Three hours of seminar per week. Prerequisites: Open only to senior psychology majors in the major and consent of instructor. For a precise schedule of offerings, check with the Student Services office each semester.

Social Psychology

160. Social Psychology. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 1. Survey of social psychology including interaction processes, small groups, attitudes and attitude change, and social issues in our culture and social perspective. This course will take an interdisciplinary approach to understanding happiness. The first part of the course will be devoted to the different treatments of happiness in the world’s philosophical traditions, focusing up close on conceptions of the good life in the Axial Age and Judeoc-Christian thought, the great traditions in East Asian thought (Taoism, Buddhism, Confucianism), and ideas about happiness that emerged more recently in the age of Enlightenment. With these different perspectives as a framework, the course will then turn to treatments of happiness in the behavioral sciences, evolutionary scholarship, and neuroscience. Special emphasis will be given to understanding how happiness arises in experiences of the moral emotions, including gratitude, compassion, reverence and awe, as well as aesthetic emotions like humor and beauty. (F,SP)

162. Human Happiness. (3) Students will receive no credit for C162 after taking C162, Letters and Science C160V or C160C. Two hours of lecture and one hour of discussion per week. Prerequisites: 160 or consent of instructor. This course will take an interdisciplinary approach to understanding happiness. The first part of the course will be devoted to the different treatments of happiness in the world’s philosophical traditions, focusing up close on conceptions of the good life in classical Greek and Judeoc-Christian thought, the great traditions in East Asian thought (Taoism, Buddhism, Confucianism), and ideas about happiness that emerged more recently in the age of Enlightenment. With these different perspectives as a framework, the course will then turn to treatments of happiness in the behavioral sciences, evolutionary scholarship, and neuroscience. Special emphasis will be given to understanding how happiness arises in experiences of the moral emotions, including gratitude, compassion, reverence and awe, as well as aesthetic emotions like humor and beauty. Also listed as Letters and Science C160V.

163. Small Group Structure and Processes. (3) Two hours of lecture and one hour of discussion per week. This course will consider small groups, their structure and processes that shape attitudes, behavior, and performance. Topics include socialization of the newcomer, conformity, power, leadership, dissent, minority influence, group decision making, interpersonal conflict, and aging. (to be determined by instructor). Consent of instructor.

164. Social Cognition. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: C120 or 150 or 160, or Cog Sci C100. Surveys empirical and theoretical approaches to our understanding of perception, memory, thought, and language concerning ourselves, other people, interpersonal behavior, and the situations in which social interaction takes place. Emphasis is placed on the integration of problems in social, personality, and cognitive psychology with the concepts and principles employed in the study of nonsocial cognition.

165. Psychology of Creativity. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: C120 or 150 or 160, or Cog Sci C100. Surveys empirical and theoretical approaches to our understanding of the processes that shape attitudes, behavior, and performance. Topics include socialization of the newcomer, conformity, power, leadership, dissent, minority influence, group decision making, interpersonal conflict, and aging. Special Course Offerings

192. Special Topics in Psychology. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Consent of instructor. Course examines current problems and issues in psychology. (F,SP)

Industrial-Organizational Psychology

180. Industrial-Organizational Psychology. (3) Two hours of lecture and one hour of discussion per week. Primarily for majors. Introduction to the field of industrial psychology, covering theory and concepts in personnel and social aspects in the field. Concerned with the processes involved in developing and maintaining organizations.

187. Topical Seminars in Psychology. (3) Course may be repeated for credit with different topic and consent of instructor. Three hours of seminar per week. Prerequisites: Consent of instructor. For a precise schedule of offerings check with Student Services office each semester.

194A-H194B. Honors Seminar. (2-3) Two hours of seminar per week. Prerequisites: Required of and limited to psychology majors in the Honors Program. H194A-H195B should be taken concurrently. In the fall semester the seminar will concentrate on issues of research design, ethics, and data analysis using statistical packages. The spring semester will focus on oral and written presentations of the thesis projects completed during the fall semester.

195A-H195B. Special Study for Honors Candidates. (1-3) Course may be repeated for a maximum of 6 units. Individual conferences. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to senior psychology majors in the Honors Program. Individual study and preparation of an honors thesis under the supervision of a faculty member. (F,SP)

197. Field Study in Psychology. (1-3) Course may be repeated for credit. Individual conferences. Must be taken on a pass/fail basis. Prerequisites: 1. appropriate upper division work in psychology (to be determined by instructor). Consent of instructor. Supervised experience relevant to specific aspects of psychology in off-campus settings. Individual and group meetings with faculty. Enrollment is restricted by

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&G requirement
AC prefix=course satisfies American Cultures requirement
W prefix=online course
H194A-H194B. Honors Seminar. (2-3) Two hours of seminar per week. Prerequisites: Required of and limited to psychology majors in the Honors Program. H194A-H195B should be taken concurrently. In the fall semester the seminar will concentrate on issues of research design, ethics, and data analysis using statistical packages. The spring semester will focus on oral and written presentations of the thesis projects completed during the fall semester.

195A-H195B. Special Study for Honors Candidates. (1-3) Course may be repeated for a maximum of 6 units. Individual conferences. Credit and grade to be awarded on completion of sequence. Prerequisites: Open only to senior psychology majors in the Honors Program. Individual study and preparation of an honors thesis under the supervision of a faculty member. (F,SP)

197. Field Study in Psychology. (1-3) Course may be repeated for credit. Individual conferences. Must be taken on a pass/fail basis. Prerequisites: 1. appropriate upper division work in psychology (to be determined by instructor). Consent of instructor. Supervised experience relevant to specific aspects of psychology in off-campus settings. Individual and group meetings with faculty. Enrollment is restricted by
Graduate Courses
Graduate standing and the consent of the instructor are prerequisites for all graduate offerings. Undergraduates may enroll only upon approval of a faculty advisor and consent of the instructor. Courses beginning each decade are designated as seminars and are designed to provide the background essential for students planning to concentrate in that area of specialization. These seminars are sufficiently general, however, for students from other areas of psychology to obtain breadth of training in central areas of study. More self-contained courses may be taken separately. For most, the sequence is not critical. See instructor before enrolling. Students from other departments must obtain permission to enroll in these courses, since they are designed primarily for first- and second-year graduate students in psychology.

Quantitative Psychology

C204. Research Reviews in Animal Behavior: Behavior Review. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Prerequisites: Graduate standing, basic course in animal behavior, and consent of instructor. This course will discuss current publications in animal behavior. A student will summarize a paper and lead the discussion that follows. Occasionally, the group reviews a manuscript in preparation, or a thesis proposal. Not all participants need report, but all are expected to attend and enter into the discussions. Guest lecturers are invited each semester. Also listed as Environ Sci, Policy, and Management C204 and Integrative Biology C204.

205A-205B. Data Analysis. (3-3) Three hours of lecture and two hours of discussion/laboratory per week. Students will need to work through problems (homework). A general data analytic course that emphasizes principles and problems, from pure experimental research through field studies. Techniques of ANOVA and multiple regression/correlation will be presented as analytical models for both lab techniques of ANOVA and multiple regression/correlation experimental research through field studies. Emphasizes design issues and problems, from pure lecture and two hours of discussion/laboratory per week. Prerequisites: B-Cat Template. (3;3;3;3;3;3)

210A-210E. Proseminar: Cognition, Brain, and Behavior. (3;3;3;3;3) Three hours of lecture per week. A survey of the field of biological psychology. Areas covered are (1) biological foundations; (2) biological bases of behavior; (3) sensation and perception; (4) learning and memory; and (5) thought and language.

211. Hormones and Behavior. (3) Three hours of lecture per week. Prerequisites: 210A-210B. A consideration of the influence of hormones on reproductive behavior, including emphasis on the process of sexual differentiation. Discussions of parental behavior, seasonal reproduction and hormonal involvement in nonreproductive processes, including eating, social behavior, learning, and memory. Emphasis on mammals.

212. Stress Effects on Brain and Behavior. (3) Three hours of lecture per week. This course will describe the impact of stress, hormones, and experience on the brain and behavior. We will adopt a multidisciplinary and interdisciplinary approach to the concept of stress. What is stress? What is social stress? What are the effects of acute and chronic stress exposure on the body physiology? What are the effects on the brain? On cognition? On gene expression? On adult neurogenesis? Also listed as Integrative Biology C240.

214. Functional MRI Methods. (3) Three hours of lecture per week. This course will provide an overview of functional MRI methodology. Topics to be covered will include the technology of BOLD fMRI signal, the spatial and temporal resolution of fMRI, issues in experimental design, and statistical techniques used for analyzing fMRI data. The class will review published as well as ongoing research projects that address questions regarding brain-behavior relationships. Students will have the opportunity to perform hands-on experience performing an fMRI experiment and analyzing the data.

Cognitive Psychology


C223. Proseminar: Problem Solving and Understanding. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly C223D. Students will analyze the literature concerning cognitive issues that transcend problem types, including representation, "understanding," access and availability of knowledge, access to one’s own cognitive processes, categorization, the architecture of the control of cognition. Also listed as Education C223A.

229. Cognition, Brain, and Behavior Colloquium. (1) Course may be repeated for credit. One and one-half hours of colloquium per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Topics will include both current research and reviews of original research in the area of cognitive psychology. Not all participants must report any given semester, but all are expected to attend and to enter into the discussions. Required course for all students in the cognition, brain, and behavior graduate program.

Clinical Psychology

230A-230B. Proseminar: Clinical Psychology. (3-3) Three hours of lecture per week. Formerly 230. Examination of major theoretical and historical themes in the development of modern clinical psychology, with special attention to concepts of mental health and psychopathology, models of intervention and clinical research, and emerging professional roles and institutions. Fall semester will focus on adult clinical practice and spring will focus on ethnic minority mental health and community/prevention.

233A-233B. Clinical Assessment: Theory, Application, and Practicum. (3-3) Three hours of lecture per week. Prerequisites: First-year status as graduate student in clinical psychology or enrollment in limited training in clinical psychology. The clinical interview and principles of methods of intellectual, objective, and projective clinical assessment. Readings, discussion, and supervised experience in clinical assessment. The first semester will focus on adult assessments; the second semester will focus on child/adolescent assessments. Required of all clinical students.

234B. Theories of Child and Family Therapy. (3) Three hours of lecture per week. Analysis of major approaches to promoting developmental change in children, couples, and families.

234C. Theories of Community Intervention. (3) Three hours of lecture per week. Examination of theory and research underlying social and community approaches to the promotion of mental health and the prevention of dysfunction. Analysis of major methods of intervention, with a special focus on consultation.

234D. Theories of Cognitive Behavior Therapy. (3) Three hours of lecture per week. Central features of cognitive behavior therapy; basics of several cognitive behavioral theories; evaluation and efficacy evidence for several disorders, primarily anxiety and affective disorders.

236. Specialty Clinic. (3) Three hours of clinic per week. Prerequisites: Open only to Clinical Science Program graduate students. A specialty clinic is offered to graduate students in the Clinical Science Program. Each course combines didactics and hands-on clinical work. Students in the coursework with the instructor to develop the topic of interest by reviewing the empirical literature, defining and developing an intervention/consultation, defining a clinical population, marketing and delivering the intervention/consultation, and evaluating the effectiveness of the intervention/consultation. A number of readings are included in the course, and class discussion is a central part of the course. Written products are also a part of this course in the form of a presentation or publication of findings from the clinic. A specialty clinic also includes its own case conference and supervisors to handle supervision of the clinical cases. (F,SP)

237A. Intervention: Adult Psychotherapy. (1) Course may be repeated for credit. One hour of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Psychological intervention with adults. (F,SP)

237B. Intervention: Child and Family Therapy. (1) Course may be repeated for credit. One hour of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Psychological intervention with children, couples, and families. (F,SP)

237C. Intervention: Community. (1) Course may be repeated for credit. One hour of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Consultation, program evaluation, program development, and prevention in community settings. (F,SP)

237E. Intervention: Clinical Decision Making. (3) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Consultation, program evaluation, program development, and prevention in community settings. (F,SP)

237F. Intervention: Couples Therapy. (1) Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Psychological intervention with couples. (F,SP)

237G. Intervention: Specialty Clinics. (1) Course may be repeated for credit. One to two hours of lecture per week. Prerequisites: Limited to second- and third-year clinical psychology students or consent of instructor. Psychological intervention with a population of specially designated populations. (F,SP)

237H. Intervention: Introduction to Clinical Methods. (1) Course may be repeated for credit. One hour of lecture per week. Prerequisites: Limited to first-year clinical psychology students or consent of instructor. This course is an introduction to the concepts of training for the clinical practicum in the psychology clinic during the second and third years of the clinical graduate program. Topics covered include clinical procedures, legal and ethical issues, risk management, standards of care, HIPAA, and consultations. (F,SP)

239. Clinical Seminar. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory
basis. Prerequisites: Graduate standing or consent of instructor. Reports and discussions of original research in the area of clinical psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discussions. Required course for all students in the clinical graduate program. (F,SP)

Developmental Psychology

240A. Proseminar: Biological, Cognitive, and Language Development. (3) Three hours of lecture per week. Survey of the biology of the nervous system and behavior; the cellular interactions during development in animals and humans, including neurogenesis, synaptogenesis, cell death and synapse elimination; and the genetic and experiential determinants of neural development. Exploration of the origins and development of thought from infancy through children, the development of children’s concepts across multiple domains including physics, biology, math, and psychology. Survey of facts and theories of language acquisition; focus on what learners acquire and the role of input in the process; review of phonology, syntax, and morphology.

240B. Proseminar: Emotional, Social, and Psychopathological Development. (3) Three hours of lecture per week. Survey of current research and theory on the origins and maintenance of normal and pathological socioemotional development in infancy. Exploration of biological, psychological, familial, and cultural factors that affect socioemotional development through childhood and adolescence. Focus of the course includes how normal or pathological trajectories are maintained in some children, while others shift into or out of clinically diagnosable disorders.

249. Developmental Seminar. (1) Course may be repeated for credit and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Reports and discussions of original research in the area of developmental psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discussions. Required course for all students in the developmental graduate program. (F,SP)

Personality Psychology

250A. Perspectives in Personality: Overview. (3) Three hours of lecture per week. Introduces the perspectives and research programs of the personality field to all students, and provides an opportunity for all students to assume a role in the field. Each week, attention is directed to the work of a different faculty member associated with the personality program.

250B. Perspectives in Personality: Trends and Issues. Three hours of lecture per week. Considers historical trends and current discussions regarding such topics as: (1) the concept of disposition; (2) person by environment transactions; (3) observational assessment of persons; (4) personality systematics; (5) personality development and concepts of structure; and (6) formulations of personality system-social system interactions.

250C. Proseminar: Social Cognition. (3) Three hours of lecture per week. Surveys empirical and theoretical approaches to our understanding of perception, memory, thought, and language concerning ourselves, other people, interpersonal behavior, and the situations in which social interaction takes place. Emphasis is placed on the integration of problems in social, personality, and clinical psychology with the concepts and principles employed in the study of non-social cognition.

250D. Principles and Pragmatics of Personality Measurement. (3) Three hours of lecture per week. Methods of personality measurement and assessment, with particular attention to the qualities, attributes, talents and dispositions considered in the everyday evaluations people make of self and others.

250E. Perspectives in Personality: Personality Theory. (2) Two hours of seminar per week. Major approaches to personality theory, including psychoanalytic, behavioral, psychometric, and humanistic theory, as well as work in culture and personality, the study of lives, and feminist psychology. Analysis of relationships between the life, work, and social-historical context of Freud, Skinner, Rogers, Eysenck, Margaret Mead, and others, with attention to the origins, course, and (on occasion) fall of each tradition. Also listed as Social Welfare C210H.

259. Personality Seminar. (1) Course may be repeated for credit and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. Reports and discussions of original research in the area of personality psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discussions. Required course for all students in the personality graduate program. (F,SP)

Social Psychology

260B. Proseminar Course in Social Psychology. (3) Course may be repeated for credit. Three hours of lecture per week. Extensive coverage of theoretical and research literature. Topics include history and Systems, attitudes and attitude change, interpersonal processes, motivation, social interaction, small groups, and organizational behavior. Required course for all students in the social graduate program.

268. Human Ecology of Memory. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. Explores the relation between memory as a cognitive function and the personal and social contexts in which remembering takes place. Emphasis on the relation between memory as a cognitive function and as a vehicle for social relations, and on the relation between individual and social memory. Sample topics: emotion and memory; collective memory; social influences on individual memory; memory in interpersonal relationships; identity and personal narrative; memory and memory in organized memory; memory as a theme linking psychology to the other social sciences, the humanities, and the arts. (F)

269. Social Seminar. (1) Course may be repeated for credit. One and one-half hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing or consent of instructor. Reports and discussion of original research in the area of social psychology. Not all participants need report in any given semester, but all are expected to attend and to enter into the discussions. Required for all students in the social graduate program. (F,SP)

Special Course Offerings

290. Seminars. Course may be repeated for credit. Two hours of seminar per week. Extensive coverage of theoretical and research literature. Topics include history and Systems, attitudes and attitude change, interpersonal processes, motivation, social interaction, small groups, and organizational behavior. Required course for all students in the social graduate program.

290B. Biological. (2) 290E. Perception. (2) 290H. Developmental. (2) 290I. Personality. (2) 290J. Social. (2) 290K. Clinical. (2) 290P. Additional Seminars on Special Topics to Be Announced. (2) 290Q. Cognition. (2) 290Z. Seminars. (3) Special section.

292. Introduction to the Profession of Psychology. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly 292A. This course provides both a broad review of the field of psychology and an introduction to the faculty of this department. Faculty from various program areas will present biographical information and discuss their particular research programs, as well as summarize current developments in their areas. The course will also cover topics in professional development (e.g., scientific writing, convention presentations, journal review processes, professional and scientific ethics, and special issues facing women and minority psychologists). Required of all first-year students in the graduate program. (F)

293. Second-Year Seminar on Professional Development. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly 293A-293B. This course will focus on various issues related to professional development. Topics may include planning a research program, preparing for qualifying exams, choosing a dissertation committee, identifying career options, preparing for conferences and in journals, preparing grant proposals, preparing for job interviews, juggling professional and personal life, and recognizing opportunities for career development. The seminar participants will select actual topics at the beginning of the term, and all will be expected to participate in the discussions. All participants will present their research at a departmental poster session at the end of the term. Required of all second-year students. (SP)

294. Current Issues Colloquium Series. (1) Course may be repeated for credit with consent of instructor. One to two hours of colloquium per week. Must be taken on a satisfactory/unsatisfactory basis. Current issues in specified areas of psychology presented weekly by announced speakers.

298. Directed Study. (1-12) Course may be repeated for credit. Individual conference. Special study under the direction of a member of the staff. (F,SP)

299. Research. (1-12) Course may be repeated for credit. Individual conferences. Individual research. (F,SP)

602. Individual Study for Doctoral Students. (1-8) Course may be repeated for credit. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field professor, intended for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (SP)

Professional Courses

300. Teaching Psychology. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. This course will provide training in a variety of teaching techniques, review relevant pedagogical issues, and assist graduate students in mastering their initial teaching experiences. (F)

301. Supervision for Teaching Psychology 2. (2) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 300; advancement to candidacy; and consent of instructor. Supervised teaching experience for graduate student instructors of Psych 2. (F,SP)

401A-401B. Clinical Internship (Off Campus). (1-12) Course may be repeated for credit. Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 300; advancement to candidacy; and consent of instructor. Individual programs of practice and supervision in approved off-campus agencies. (F,SP) Staff
39. Freshman/Sophomore Seminar. (2-4) Course may be repeated for credit as topic varies. Prior courses given to freshmen and sophomores. Seminar format. One to two hours of discussion per week. One to two sections for each semester. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Freshman and sophomore seminars offer lower division students the opportunity to explore ideas and gain research experience as a research assistant, team member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F,SP) Staff.

97. Field Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Variable format. Must be taken on a passed/not passed basis. (F,SP) Staff.

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Variable format. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. (F,SP) Staff.

Upper Division Courses

C102. Bacterial Pathogenesis. (3) Three hours of lecture per week. Prerequisites: Molecular and Cell Biology 104A, Chemistry 130 or Molecular and Cell Biology 102 or consent of instructor. This course for upper division and graduate students will explore the molecular and cellular basis of microbial pathogenesis. The course will focus on model microbial systems which illustrate mechanistic basis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions. Also listed as Molecular and Cell Biology C103 and Plant and Microbial Biology C103. (SP) Portnoy.

103. Drugs, Health, and Society. (2) Two hours of lecture and one hour of discussion per week. Introduces undergraduates to concepts basic to understanding and analyzing relationships between drugs, health, and society. Using a broad multi-disciplinary perspective, examines legal and illegal drugs and their effects on personal and community health. Prevention of drug problems at the policy, community, organizational, and individual levels will be examined. (SP) Kodama.

104A-104B. Health Promotion in a College Setting. (2,2) Course may be repeated for credit. One and one-half hours of lecture and one hour of discussion per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Topics include health promotion, medical self-care, and delivery of health care service. Through a combined theory and practice approach, topics are covered as they apply to the campus community. The course is divided into three sections corresponding to particular campus health field experiences in which students may be involved. (F) Kodama.

105. Policy, Planning, and Evaluation of Health Programs in a College Setting. (2,2) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 14, 104A or 104B, and consent of instructor. Theory and practice of policy planning, implementation, and evaluation of health promotion programs in a college setting. Comparison of different methodologies (peer education, teaching, problem-solving, organizational change), content areas (smoking, nutrition, alcohol, drugs, sexuality, women’s health, self-care, health services), and settings (clinical, classroom, living room, campus). (F,SP) Kodama.
be taken on a
issues in healthcare, with emphasis on the social and political fac-
connections between personal health and public
practice, health promotion philosophy, social conscious-
society and the impact to community. Classes will
be offered odd-numbered years. (F) Jagust

130AC. Aging, Health, and Diversity. (3) Three hours of lecture per week. Formerly 130. The goal of this seminar is to provide a critical examination of aging and health from a broad, multicultural perspec-
tive. Political economy and life course perspectives will be among the key theoretical frameworks used to examine how race, class, culture, gender, and sexual orientation interact to help shape and deter-
mine the health and well-being of the elderly and their access to health care. Demographic trends and policies for the elderly will be examined in socio-
historical perspective with attention to their salience in a multicultural society. The course will be offered at the undergraduate level and will be open to graduate students and will serve as an elective for the new Multi-
cultural Health Specialty Area in the School of Public Health. This course satisfies the American Cultures requirement. (SP) Kodama

131AC. Race, Ethnicity, and Health in America. (3) Three hours of lecture per week. This course will attempt to integrate public health theory, values, and practice into a curriculum that acknowledges and values the health practices and philosophies of African American, Chicano/Latino, Asian, and Native American communities. By examining the historical and cultural
prerequisites to health for each ethnic community, this course will allow students to fully appreciate the distinct contributions of each group. This course satisfies the American Cultures requirement. (SP) Kodama

140. Introduction to Risk and Demographic Stat-
istics. (4) Three hours of lecture and two hours of dis-
cussion per week. Prerequisites: One year of calculus.
Statistical and evaluation methods in studies of human mortality, morbidity, and natality. History of statistical terminology and notation, critical appraisal of registry and census data, measurement of risk and introduction to life tables. Computational systems and the analysis of mass data. (F) Tarter

142. Introduction to Probability and Statistics in
Biology and Public Health. (4) Three hours of lecture and two hours of discussion.
Prerequisites: High school algebra. Formerly 142A. Descriptive statistics, probability, probability distributions, point and interval estimation, hypothesis testing, chi-square, correlation and regression with biomedical applica-
tions. (F) Selvin

143. Introduction to Statistical Methods in
Computational and Genomic Biology. (4) Three hours of lecture and one hour of laboratory per week. Prereq-
uires: 142, Statistics 134, 135 or consent of instruc-
tor. This course explores statistical and computational methods for the analysis of biomed-
ical and genomic data. Statistical topics, introduced in a biological context, include numerical and graphi-
cal summaries of data; basic notions in probability; loss-based estimation (e.g., least-squares regression, maximum likelihood estimation); model selection; mul-
tiple hypothesis testing; Markov chains; hidden Markov models, resampling; simulation studies. Biological questions considered include, but are not limited to,
modeling meiosis; genetic mapping; nucleotide and protein-sequence analysis; molecular evolution; computational gene finding; and DNA microarray experiments. The course also introduces statistical computing resources for the analysis of biological data, with emphasis on the R language and envi-
ronment (r-project.org) and Bioconductor (bioconductor.org). In addition, the course introduces basic notions in genetics and molecular biology and involves the critical reading of articles related to sta-
tistical analyses in the biological and medical sci-
cences. Also listed as Statistics C143. (SP) Dudoit

C143. Introduction to Statistical Methods in
Computational and Genomic Biology. (4) Three hours of lecture and one hour of laboratory per week. Prereq-
uires: 142, Statistics 134, 135 or consent of instruc-
tor. This course explores statistical and computational methods for the analysis of biomed-
ical and genomic data. Statistical topics, introduced in a biological context, include numerical and graphi-
cal summaries of data; basic notions in probability; loss-based estimation (e.g., least-squares regression, maximum likelihood estimation); model selection; mul-
tiple hypothesis testing; Markov chains; hidden Markov models, resampling; simulation studies. Biological questions considered include, but are not limited to,
modeling meiosis; genetic mapping; nucleotide and protein-sequence analysis; molecular evolution; computational gene finding; and DNA microarray experiments. The course also introduces statistical computing resources for the analysis of biological data, with emphasis on the R language and envi-
ronment (r-project.org) and Bioconductor (bioconductor.org). In addition, the course introduces basic notions in genetics and molecular biology and involves the critical reading of articles related to sta-
tistical analyses in the biological and medical sci-
cences. Also listed as Statistics C143. (SP) Dudoit

144A. Introduction to Statistical Methods in Com-
putational and Genomic Biology. (4) Three hours of lecture and two hours of lab-
oratory, and two hours of work outside of class per week for eight weeks. Prerequisites: 142 or consent of instructor. This course is intended to serve as an introduction to the SAS programming language for Windows in an applied, workshop environment. Emphasis is on data management and programming in a public health research setting. Topics include SAS language to construct data sets, access variables as well as sort, subset, concatenate, and merge data sets. SAS statistical procedures will be used to compute univariate and bivariate summary statistics, make statistical plots, and statistical output data sets. (SP) Lein

144B. Intermediate SAS Programming. (2) enroll-
ment is limited to School of Public Health students. If space permits, others may enroll with consent of instructor. Two hours of lecture, two hours of laboratory, and two hours of work outside of class per week for eight weeks. Prerequisites: 144A. Topics include data step flow control, looping and automated programming, macros and macro functions, computa-
tion strategies, data set reconfiguration, use of SAS Macro variables, and writing simple SAS Macro pro-
gams. (SP) Lein

145. Statistical Analysis of Continuous Outcome
Data. (4) Three hours of lecture and two hours of lab-
oratory per week. Prerequisites: C142 or equivalent. Formerly 142B. Regression models for continuous outcome data: least squares estimates and their properties, interpreting coefficients, prediction, model assumptions, model checking, model transformations, outliers, and influential points. Cate-
ergorical explanatory variables: interaction and analy-
sis of covariance, correlation and partial correlation. Approaches to computer assisted techniques and statistical computing. Analysis of variance for one- and two-factor models: F tests, assumption checking, multiple com-
parisons. Random effects models and variance

Two hours of lecture per week. This course addresses violence as a public health issue, using an interdisci-
plinary public health approach to enable undergradu-
ate students to explore and analyze violence from personal, social, community, and political perspec-
tives. Beginning with individual experiences of vio-
ence (and how they will go on to affect the larger con-
texts on gender and race-based violence, firearms, poverty, youth, and collective violence; students will learn to apply public health strategies to identify causes of violence and develop practical community-based plans to prevent violence and promote safety. (F) Creighton, Kodama

112. Global Health: A Multidisciplinary Examina-
tion. (4) Three hours of lecture and one hour of dis-
cussion per week. This course examines health at the individual and community level by exam-
ing the interplay of many factors, including the legal, social, political, and physical environments; economic forces; access to food, safe water, sanitation, and affordable prevention/medical care; nutrition, cultural beliefs and human behaviors; and religion, among others. Students will be expected to read, understand, and use advanced materials from diverse disciplines. Class assignments by case-based discussions. (SP) Krishnan, Rainigold

113. Campus/Community Health Impact Program. (3) Three hours of lecture per week. The primary goal of this course will be to challenge students to begin the process of understanding the interconnectedness between public health and the larger context of society and the impact to community. Classes will
cover the principles of public health and social jus-
tice, health promotion philosophy, social conscious-
ness, current issues, community action theory, health issues, diversity and oppression theories. Students are expected to participate in a community-oriented project of their own choosing. The goal of the comm-
unity project cannot be achieved through service learning activities, which will further reinforce the connections between personal health and public health issues. (F) Rincón

114. Issues in Personal and Community Health
Promotion. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Any of the following: 150A-150B, Biology 1A or 1B, Cognitive Science C1, Molecular and Cell Biol-
obies of aging including Alzheimer’s and Parkinson’s disease, the research process and advances in cellular and molecular mech-
amisms, neuroendocrine changes with aging, depres-
sion and aging, epidemiology of aging, and risk factors for decline. Also listed as Neuroscience C129. Offered odd-numbered years. (F) Jagust

130. Violence, Social Justice, and Public Health. (2) Three
hours of lecture per week. Prerequisites: All course partic-
ants must be accepted into the UC Berkeley MH/GH Fellowship Program. This course is designed to pre-
pare trainees in the UC Berkeley Minority Health/ Global Health (MH/GH) Program to conduct a 10-
week immersion experience in a global Senate. The course provides a background in neglected tropical disease research, international research ethics, and the conduct of health research in low-resource settings. Also listed as Integrative Biology C119S. (SP) Rainigold

126. Health Economics and Public Policy. (3) Three
hours of lecture/discussion per week. Prerequisites: Public Health major or consent of instructor. This course focuses on a selected set of the major health policy issues and uses economics to uncover and
better understand the issues. The course examines the scope for government intervention in health mar-
kets. (SP) Scheffler
Satariano

C155. Sociology of Health and Medicine. (4) Students must take C155 after fulfilling the requirement of Sociology 155 or C155. Three hours of lecture per week. Prerequisites: Sociology 1, 3, 3AC, or consent of instructor. This course will consist of a survey of the major social, cultural, and bio-behavioral patterns of health and illness in individuals, families, neighborhoods, and communities. The course will also address the design, implementation, and evaluation of leading social and behavioral interventions and social policies to improve the community and population health. This course will satisfy one of the core requirements for the undergraduate major in public health. This course satisfies the American Cultures requirement. (SP) Satarianno

150E. Introduction to Community Health and Human Development. (3) Three hours of lecture and one hour of discussion per week. Prerequisites: Third or fourth undergraduate standing or consent of instructor. This course will consist of a survey of the major social, cultural, and bio-behavioral patterns of health and illness in individuals, families, neighborhoods, and communities. The course will also address the design, implementation, and evaluation of leading social and behavioral interventions and social policies to improve the community and population health. This course will satisfy one of the core requirements for the undergraduate major in public health. This course satisfies the American Cultures requirement. (SP) Satarianno

C160. Environmental Health and Development. (4) Three hours of lecture and one hour of discussion per week. The health effects of environmental alterations caused by development programs and other human activities, including pollution and development in developing countries. Case studies will contextualize methodological information and incorporate a global perspective on environmentally mediated diseases in diverse populations. Topics include water and sanitation, air and noise pollution; climate change; occupational health; food and food safety; nutrition and growth; infectious disease; energy development; air pollution; greenhouse gases; chemical use, etc. Also listed as Environ Sci, Policy, and Management C167. (F,SP)

162A. Public Health Microbiology. (3) Three hours of lecture per week. Prerequisites: One year of college-level biology and chemistry. Introduction to properties of microorganisms; their relationships with humans in causing infectious diseases and in maintaining health. With 162L, satisfies most requirements for a laboratory course in microbiology. May be taken without 162L. (F) Buening, Danielson

162L. Public Health Microbiology Laboratory. (1) Two hours of lecture per week. Prerequisites: One year of college-level biology and chemistry. Students must take 162A concurrently or have taken it previously. To accompany 162A. (F) Loretz

C170B. Advanced Toxicology. (3,4) Three to four hours of lecture per week. Prerequisites: Nutritional Science and Toxicology 110 for 3-unit option. The application of toxicology to answer questions about safety and risk. Using a case-study approach, participants will learn to evaluate data and apply their knowledge to evaluating the risk presented by exposures to toxic chemicals, including drugs and environmental contaminants. Discussion of current topics of controversy in the field of toxicology. Also listed as Nutritional Science and Toxicology C119. (SP) M. Smith

172. Introduction to Pharmacology and Toxicology. (3) Three hours of lecture per week. Prerequisites: Organic chemistry; upper-division biological science. Principles of drug design and toxicology. Brief survey of major groups of chemicals used in therapy. (SP) Wei

172L. Public Health Microbiology Laboratory. (1) Two hours of lecture per week. Prerequisites: One year of college-level biology and chemistry. Introduction to properties of microorganisms; their relationships with humans in causing infectious diseases and in maintaining health. With 172L, satisfies most requirements for a laboratory course in microbiology. May be taken without 172L. (F) Buening, Danielson

180. The Evolution of Human Sexuality. (2) Two hours of seminar per week. This course is built around an evolutionary perspective of the basis of human mating behavior and explores a variety of topics in human sexuality with the goal of helping us to understand ourselves and to understand and accept the behavior of others. The course takes examples from art, society, anthropology, psychology, history, contemporary politics, and history to explore the richness of human sexual behavior and reproduction and the interaction between our biology and our culture. (F) Potts

181. Poverty and Population. (3) Two hours of lecture and one hour of discussion per week. Globally, one million more births than deaths occur every 112 hours, 90% in the poorest countries. Between 1960 and 2000, one billion people were added to the world's population. The attention was focused on rapid population growth as the root cause of many developmental problems, poverty, and environmental degradation. This course will emphasize the understanding of the relationships between population growth, poverty, and environmental degradation. It will explore the political "fashions" underlying changing paradigms among demographers, economists, and development specialists. (F,SP) Campbell, Potts, Prata

183. The History of Medicine, Public Health, and the Allied Health Sciences. (3) Three hours of lecture per week. Prerequisites: Knowledge of—and preferably a college level course which covered—basic principles of drug design and toxicology. Graduate or upper-division undergraduate status. This course will examine the historical developments of social and scientific responses to human disease from their beginnings to their current roles as major forces in modern society. It will consider the evolution of diagnoses, treatment, and prevention of human morbidity and death from both a humanistic and scientific perspective. It will cover pre-medical, pre-dental, and other sciences, as well as medical science, public health, nursing, optometry, or the other health sciences. Stu-
both nationally and internationally, will be covered. (F) Bates, K. Smith

200C3. Health and Social Behavior Breadth. (2) Two hours of lecture per week. Health and social behavior uses theory and research from the behavioral sciences to explain the causes and health effects of salu-
tary and risky behavior. (SP) Catalano

200D. Applied Public Health: Putting Theory Into Practice. (2) Two hours of lecture per week. Prereq-
usites: 142, 200C, and 250A. This course trains stu-
dents in applied public health through discussion, lectures, guest speakers, cases, and field trips. Stu-
dents integrate learning from previous courses with work experience. Cases emphasize current national/ global public health issues and practice. At course comple-
tion, students will be able to demonstrate the capacity to identify, research, and respond to real-life public health challenges; work effectively and efficiently in problem-solving groups; professionally present the results of their effort to large groups for feedback and evaluation. (SP) Bratt, Rundall, Winklestein

201E. Public Health Interventions: Theory, Prac-
tice, and Research. (2,3) Two hours of seminar per week. Prerequisites: Previous experience with health interventions and doctoral student status or consent of instructor. This course focuses on the primary factors that affect health and the interventions that can pro-
不忘, students examine the determinants of health status and practice, and approaches of public health interventions. Community level interventions and multidisciplinary approaches receive special emphasis. The course stresses a righ-
ter view of the outcomes of interventions and the practical implications of the theory. Stu-
dents can act in a role in the design and conduct of the course. (SP) Neuhauser, Syme

201F. Community-Based Research and Interven-
tions to Promote Health: Theory and Methods. (3) Three hours of lecture per week. Prerequisites: Gradu-
ate standing. This course will delve into theoretical, methodological, and practical considerations in con-
ducting physical and mental health interventions in diverse communities. Course emphasizes: (1) con-
ceptualization and implementation of community inter-
ventions within ecological models and principles; (2) logic models of intervention process and outcomes; (3) comparing and integrating prevention science and community-based participatory approaches to inter-
vention; (4) strategies and challenges in replicating and diffusing community-based interventions across diverse social and cultural settings; and (5) cultural competency in com-
munity intervention development. (F) Ozer

202B. Ethnic and Cultural Diversity in Health Status and Behavior. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Focus on ethnic and cultural diversity in mental health behavior, the development of public health programs and policies. Considers U.S. ethnic minority groups and cul-
tural groups in non-Western societies. Health status and behavior examined in context of relevant social and an-
tropolitical theory (social class, acculturation, political economy). Influence of socio-cultural background on concepts of health, illness, and health-seeking behavior. Implications for planning public health programs and policies. (SP) Herd

202B2. Ethnic and Cultural Diversity in Health Status and Behavior. (2) Two hours of lecture per week. Prereq-
usites: Graduate standing or consent of instructor. Focus on ethnic and cultural diversity in health behav-
ior as a basis for public health programs. Consider-
ations of U.S. ethnic minority groups and cultural settings that lead to the development of public health programs and policies. Considers U.S. ethnic minority groups and cul-
tural groups in non-Western societies. Health status and behav-
ior examined in context of relevant social and an-
tropolitical theory (social class, acculturation, political economy). Influence of socio-cultural background on concepts of health, illness, and health-seeking behavior. Implications for planning public health programs and policies. Also listed as Environ Sci, Policy, and Management 202B2.

202G. Advanced Alcohol Research Seminar. (1) Course may be repeated for credit. Two hours of sem-
in per week. This course is an advanced alcohol research seminar in which presentations are made by alcohol research scientists nationally and interna-
tionally, as well as pre- and post-doctoral fellows, and faculty focus on special topics in alcohol psychosocial research in the field each semester. Covered are the epidemiology of drinking patterns and alco-
hol-related problems, issues related to treatment of alcohol-related problems and research. Guest presentations are also provided (related to topics outside psychosocial research) to provide a breadth of understanding in the field. The seminar also includes sessions focusing on conference and manuscript writing, and research ethics in the alcohol research and grant writing, and has a research ethics component covering a number of ses-
s. (SP) Chepitel, Kasketus

203A. Theories of Health and Social Behavior. (3) Three hours of lecture per week. Prerequisites: Back-
ground in social and behavioral sciences. Consent of in-
cstructor. The course provides a survey of theoretical perspectives and their application in analyzing the behavorial, social, and cultural dimensions of com-
tical issues that arise within the context of diverse and in-
ternational public health issues. Examples are drawn from a wide range of public health issues. (F) Staff

204A. Mass Communications in Public Health. (3) Three hours of lecture per week. Prereq-
usites: Graduate standing or consent of instructor. Examines the role of mass communication in advanc-
ing public health goals. Reviews mass media theo-
ries in general, and mass communication theory in special. Provides an in-depth understanding of media advocacy as a strategy for using news media and paid advertising to support policy initiatives at the local, state, and federal levels. Examples are drawn from a wide range of public health issues. (F) Staff

204D. Community Organizing and Community Building for Health. (3,4) Three hours of lecture per week. Prerequisites: Consent of instructor. This course emphasizes community organizing and community building as major approaches to improving health com-
munities and fostering broader social change. It further examines the role of public health practitioners as change agents, stressing in particular the values and skills neces-
sary to do this work. The seminar also includes a functional understanding of cultural competence and the development of skills in applying such knowledge in the areas of community organizing and community building. This is a Service Learning Course, and students wishing to undertake a concurrent field project can earn an additional optional unit of credit. (F) Minkler

204E. Multicultural Competence in Public Health. (3) Three hours of lecture per week. Prereq-
usites: Consent of instructor. This course focuses on the development of cultural competence and will include special topics related to cultural adaptations and diversity in public health practice. Focus on the development of cultural competence and the role of the public health practitioner. Students will be expected to demonstrate cultural competencies in professional practice. The seminar also includes a functional understanding of cultural competence and the development of skills in applying such knowledge in the areas of community organizing and community building. This is a Service Learning Course, and students wishing to undertake a concurrent field project can earn an additional optional unit of credit. (F) Minkler

205. Program Planning, Development, and Evalu-
(3) Three hours of lecture/discussion per week. Prerequisites: Public Health students. Basic elements and con-
siderations in planning health programs; case material will be drawn from health settings, with empha-
sis on multidisciplinary planning. Assessment of prob-
lems, setting goals and objectives, designing activities, implementation, and evaluation. (SP) Staff

206. PH Nutrition Core Course: Critical Issues in Public Health Nutrition. (2) Two hours of lecture/dis-
cussion per week. Prerequisites: Master of Public Health students. This course will introduce first-year public health nutrition and other MPH students to crit-
ial issues in public health nutrition, and provide them with critical-thinking skills to analyze these issues using scientific literature. Students will build group work to develop critical thinking skills and communi-
cation advocacy skills. Second-year public health nutri-
tion students and a panel of PHN graduates will speak to the students about valuable skills and competencies needed for work in public health nutrition. (F) Fernald

206A. Measuring Dietary Intake and Nutritional Status. (2) Two hours of lecture/discussion per week. Prereq-
usites: Graduate standing or consent of instructor. Concepts, methods, and limitations in the deter-
mination of nutritional status; application of methodol-
gies for determining and interpreting data; technical, social, and political implications of nutritional assess-
ments and related community needs. (SP) Staff

206B. Food and Nutrition Policies and Programs. (3) Three hours of lecture/discussion per week. Prereq-
usites: Graduate standing or consent of instructor. This course examines the historical origins of food and nutrition improvement programs in the United States, including the political and administrative condi-
tions that led to the development of current policies and programs. It also examines the goals, design, operations, and effectiveness of some of these programs: Food Stamp Program, Special Supplemental Nutrition Program for Women, Infants, and Children, National School Lunch Program; School Breakfast Program; Head Start; Child Care Food Program; and the Elderly Nutri-
tion Program. (SP) Fernald

206C. Nutritional Epidemiology. (3) Three hours of lec-
ture per week. This course develops the ability to read and understand nutritional epidemiological research critically. Basic research methods in nutritional epidemiology will be reviewed, and issues in design, analysis, and interpretation unique to nutritional epidemiology will be introduced. This will be accomplished through readings and study questions, lecture/discussions, and prob-
lem sets. (F) Block

206D. Food and Nutrition Programs and Policies in Developing Countries. (2) Two hours of lecture/dis-
cussion per week. Prerequisites: Graduate standing or con-
sent of instructor. The course will overview the roles in which governments in developing countries design and implement policies and programs that affect food production and access to safe, affordable, and nutri-
tionally adequate diets. This course will teach stu-
dents how to analyze, assess, and take action to ameliorate the major nutritional problems facing people in developing countries. We will cover nutritional deficien-
cies at both the macro- and microlevels, the contribu-
tion in infectious diseases, and the impact of nutrition
210. Maternal and Child Health Specialty Area Core Course. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The core course in maternal and child health will provide an integrated approach to issues, programs, and policies in the field of maternal and child health. The following concepts will be explored and addressed in depth: (1) the foundation of public health barriers and each other to policy design and implementation; the historical, social, economic, environmental, and political factors that determine health policy; the determinants of health and the ways in which these factors promote or act as barriers to achieving a functional and sustainable food system that promotes optimal food, nutrition, and health. (SP) Fernald

207A. Public Health Aspects of Maternal and Child Nutrition. (2,3) Two hours of lecture/discussion per week. Prerequisites: Consent of instructor; previous coursework in epidemiology or consent of instructor. The course examines the determinants of family size with emphasis on methods of study. The course considers the role of health professionals in: (1) documenting the health and social consequences of family size and fecundity and of contraceptive and other family planning services; (2) assessing the impact of public health issues of health and nutrition on family size; and assessing the role played by contraception, voluntary sterilization, and induced abortion in the transition to small families. The course will focus on current interventions and possible approaches to policy design and implementation. (SP) Staff

211. Adolescent Health. (3) Three hours of lecture/discussion per week. The original five major health problems facing adolescents (and occurring at any age) are cognitive; and occur at multiple levels, and we will study them from a variety of viewpoints (biological, psychosocial, political, public health). This course will provide students with the tools to make informed judgments about adolescent reproductive health and the role of accountability for the past abuses in prevention. (SP) Iacopino, Weinstein

212A. International Maternal and Child Health. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. The course examines the determinants of family size with emphasis on methods of study. The course considers the role of health professionals in: (1) documenting the health and social consequences of family size and fecundity and of contraceptive and other family planning services; (2) assessing the impact of public health issues of health and nutrition on family size; and assessing the role played by contraception, voluntary sterilization, and induced abortion in the transition to small families. The course will focus on current interventions and possible approaches to policy design and implementation. (SP) Staff

212C. Migration and Health: A U.S.-Mexico Binational Perspective. (2-3) Two hours of lecture and one hour of discussion per week. Building upon expertise on migration from Mexico to the United States, the goal of this course is to strengthen students' knowledge of public health issues of immigrants and the effects that migration has on the health/disease issues of communities in the countries of origin, transit, and destination. Students will explore successful intervention programs targeting these populations. (SP) Guendelman

212D. Global Health Core Course. (3) Three hours of lecture per week. Prerequisites: Qualified seniors may enroll with prior consent of instructor. This is a graduate-level survey course on selected topics in international health designed to introduce students to key areas of the specialty. The course will review the main contributors to the global burden of disease and discuss current approaches and possible ways to address the future. The primary goal of the course is to transfer knowledge and experiences that will prepare public health students to evaluate international health projects and better prepare themselves for international health work. The focus is on developing countries with the most challenging large-scale health problems, where physical and systems infrastructure as well as human resources are poorly developed. The course provides students with the tools to make their own assessments. Complex ethical and political issues pertaining to the social determinants of health will also be addressed throughout the course. (SP) Staff

212E. Private Sector Health Services in Developing Countries. (2) Three hours of lecture per week. Prerequisites: Graduate standing. This course will serve students intending to conduct research, policy work, or program implementation in health services in developing countries. Topics covered will include definition and typology of private sector in various countries, theories of private sector regulation, motivation, and research. Methodological and practical issues in measuring provider importance, quality, and in influencing the allocation of private health delivery will be explored from viewpoints of both research and programmatic intervention. (SP) Montagu, Prata

213A. Family Planning, Population Change, and Health. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course examines the determinants of family size and the role played by contraception, voluntary sterilization, and induced abortion in the transition to small families. It looks at the factors controlling access to fertility regulation in developing and developed countries and discusses the factors that have made for successful family programs as well as those that have not. It examines the controversy over what the role of family planning and the health of women and children and at the role of family size in economic development and environmental problems. It examines the roles of the United Nations, and promotion of services and discusses ethical issues facing providers. (F) Campbell, Potts, Prata

214C. Current Issues in Women's Health. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Provides an overview of current controversies surrounding MCH and contemporary issues in women’s health throughout the life span; present ways to integrate women’s health issues into the broader study and practice of public health. Students will examine women’s health care controversies and propose possible solutions. (SP) Staff

215A. Public Health Aspects of Maternal and Child Health. (2) Two hours of lecture per week. This is an interdisciplinary course which will adopt a broad-based ecological perspective of health and behavior. This class will emphasize the interconnected and multidirectional relationships between biology, behavior, and the social environment. The course will be conducted as a seminar series (with a focus on biological processes). We will review and analyze the state of the art of how biological, psychological, and social processes interact over a lifetime to influence health and vulnerability to disease (a developmental epigenetic perspective). Rather than focusing on “social factors” in health and disease, we will focus on “how” social factors may regulate/change biological measures. Three very general themes will be addressed: development, “social” neuroscience, and gene–environment interactions as they relate to behavior. Topics such as constraints/ plasticity and behavior, genetic determinism, vulnerability versus resilience, gene–environment interactions, and the influence of public–private-sector policies on health and health-related behavior in the elderly. Weekly lectures by the faculty will be complemented by student-presented papers on recent research in the areas of genomics and gerontology. This is the core course for the School of Public Health specialty in aging and public health. (F) Satinario

217D. Biological and Public Health Aspects of Alzheimer’s Disease. (3) Two hours of seminar/dissertation per week. Prerequisites: Graduate standing or consent of instructor. Background in biological sciences is expected. This course will survey the field of Alzheimer’s disease (AD) from a biological and public health perspective. The course will highlight recent papers in the fields of medicine, neuroscience, and epidemiology. The course will begin with a historical survey of the field of AD, followed by a descriptive overview of classic and new findings. Subsequent classes will cover the genetics and molecular biology of the disease, as well as biomarkers, epide- miology, risk factors, treatment, development of new therapeutic approaches, and recent research. The course will also serve as a model for the analysis of complex diseases with multiple genetic and environmental causes, and late onset neurodegenerative dis- eases. The course will also serve as a model for the analysis of complex diseases with multiple genetic and environmental causes, and late-onset neurodegenerative disease. Also listed as Neuroscience C217D. (SP) Jagust
218B. Evaluation of Health and Social Programs. (3) Three hours of lecture/discussion per week. The study of concepts, methods, rationale, and uses of evaluation research as they apply to health and social programs. (SP) Staff

218C. Advanced Program and Policy Evaluation. (3) Three hours of lecture/discussion per week. Prerequisites: Introductory course on program evaluation such as 218B. This is an advanced course on evaluation research for those who have completed an introductory course on program evaluation (such as 218B), and it will be especially useful to doctoral students intending to pursue careers as policy analysts or evaluators. By the completion of this course, students will be able to: (1) identify the stages of development of evaluation theory and describe the important differences in the theories that were developed; (2) describe the evaluation theories of at least eight leading evaluation theorists and discuss the strengths and weaknesses of each approach; (3) identify the theoretical perspectives that have influenced the implementation of published evaluation studies; (4) distinguish among the following types of meta-evaluations: an evaluation audit, a critical review and re-analysis, a research synthesis, and a meta-analysis; (5) conduct a meta-evaluation; and (6) present a meta-evaluation to peers in a professional setting. (SP) Rundall

219A. Advanced Methods: Qualitative Research. (3) Three hours of lecture/discussion per week. Prerequisites: Doctoral student in public health or a related discipline or instructor permission. An overview of the theoretical and methodological components involved in various aspects of qualitative research. (SP) Staff

219C. Community-Based Participatory Research in Public Health. (3-4) Three hours of lecture/discussion per week. The goal of this seminar is to provide doctoral and/or master’s degree students with an understanding of theories, principles, and strategies of community-based participatory research (CBPR) and related traditions. The advantages and limitations of this approach for effective evaluation, and theory-driven case studies will be explored. Students undertaking a service-learning project applying CBPR may receive a 4th unit. (SP) Minkler

219D. Social and Behavioral Health Research: Introduction to Survey Methods. (3) Three hours of lecture per week. This course provides students with a thorough tool kit for designing survey questionnaires and for implementing telephone, face-to-face, and web surveys. The three-hour weekly class sessions are designed to convey practical knowledge, with a case study approach used to complement each topical lecture. An SPSS laboratory is also given each semester. The class is negative for health and social behavior students, and many from the multidisciplinary program and other tracks in the school (including UCSF, e.g., nurses in their Ph.D. programs) have often enrolled as well. By the end of the semester, students will have designed, as their class project, a research project including a study design rationale, aims and hypotheses, data collection methods and measures, human subjects consent form, codebook, and analysis plan. (F) Karnik-Jaffe

219E. Introduction to Qualitative Methods in Public Health Research. (3) Two hours of seminar per week. This course is designed to familiarize students who have little or no experience in conducting qualitative research with the perspectives, methods, and techniques of a vast and contentious tradition of research. The course will cover some of the methods of data collections used in the conduct of qualitative inquiries, the analysis of textual data, and the development of the results from qualitative research and the development of a qualitative research proposal. While learning about qualitative methods, students will gain an understanding of the qualitative research literature on a topic of their interest and the ways to interpret findings in qualitative research from a variety of qualitative studies on a research question topic of. (SP) Miller

220. Health Policy Decision Making. (3) Three hours of lecture/discussions per week. Introduction to federal/level health policy and analysis of government capability in addressing major issues in health policy. The course explores structural impediments to reform in the United States, regulatory decision making—their nature, the role of uncertainty, and basic tools of policy analysis. Students will apply these tools in a seminar paper that analyzes a proposed or existing health policy or program. (F) Sentell

220A. Health Policies and Policy. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Introduction to some of the major analytic concepts in public political and their applications to current health care policy. Topics include policy, interest, conflict, equity, poverty, paternalism, security, rights, rules, and representation. (SP) Halpin

220C. Health Risk Assessment, Regulation, and Policy. (4) Four hours of lecture per week. Prerequisites: 250A, 270A-270B recommended. Graduate standing. This course introduces the basic scientific components of environmental and occupational health risk assessment and describes the policy context in which decisions to manage environmental health risks are made. The course presents the quantitative methods used to assess the human health risks associated with exposure to toxic chemicals, focusing on the four major components of risk assessment: hazard identification, dose-response assessment, risk characterization. Students use these tools to develop their own risk assessment for an environmental health problem. The course also provides a broad overview of state and federal environmental health regulations with consideration of how hazard, risk, cost, and benefits are considered. Current political controversies about environmental policy will be examined. (F) Hammond, McKinnon

220D. Health Policy Advocacy. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. A graduate seminar in practice-based means to advocate for health policy. This course focuses on data based strategies for leading advocacy efforts, including skills necessary to preserve and improve the health status of populations. Students will develop research, organization, and coalition-building skills necessary to produce an effective advocacy campaign. The course identifies the roles of those involved in the making of policy and demonstrates the use of appropriate channels and technologies to influence health policy change. (F) Snyder

220E. Global Health Policy. (2,3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing. This course will provide an intensive introduction to current topics in international health policy. Students will interact with the major actors, institutions, and regimes that shape international health policy. The course will also introduce students to theories of governance as they apply to international settings and evaluate the role of state actors, NGOs, and international regimes in producing key health policy outcomes. The course will cover several current issues in international health and will require students to critically assess the state of the field. Using Bardach’s method for policy analysis, students will analyze current policies and propose policy alternatives with an assessment of the tradeoffs implied in choosing a given policy option over its competitors. (F) Keller

220F. Health Workforce and Public Policy. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing. This course focuses on three inter-related issues: How do we determine when we have enough health care workers to meet public needs? What are the productivity, quality, and cost effective care? What are the factors that determine the supply and distribution of health care workers? What are the methods that can be used to increase the performance and productivity of health care workers? Students will critique the policy implications of existing workforce research and identify trends and issues that will affect the workforce in the future. (SP) Robinson

221. Mental Health Policies, Programs, and Services. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This course provides a foundation for understanding mental illness and mental health services and the evolution and current state of our thinking about them. It presents the most frequent varieties of mental illness and addresses their frequency of occurrence, and it addresses the social disability from mental illness and the societal response to mental illness. It also considers treatments, services, effectiveness, quality of care, and financing, as well as the consequences of financing, legal issues, and concerns and services for children and youth. In addition, the course provides a forum to critically examine the knowledge base on mental illness, epidemiology, and the treatment and services as it presents major controversies and highlights the best available evidence. (SP) Snowden

221B. Understanding and Overcoming Health Care Disparities. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This course provides a framework to formulate explanations for health care disparities and to construct responses that have the potential for a policy-oriented and, therefore, widespread response. Taking advantage of selected developments in social science theory and research that can provide insight into how health care disparities come about, we will draw from anthropological and psychological theories of cultural orientation, cultural framing of problems, and cultural identity, as well as from psychological theories of stress and coping. We also will draw from sociological theories of individual and community poverty, and theories characterizing health care system design and service delivery. (F) Snowden

222A. Health Care Technology Policy. (2) Two hours of lecture per week. The course examines the public policy institution and issues facing innovation, regulation, and payment for biotechnologies, pharmaceuticals, and medical devices. Topics include technology transfer and patent law, the Food and Drug Administration (FDA) review for safety and efficacy, insurance coverage policy at the Center for Medicare and Medicaid Services (CMS), coverage, payment, and benefit by private insurers for new technologies, and cost-effectiveness analysis. Special topics vary from year to year. Examples and case studies are drawn from all three of the technology sectors. (F) Robinson

222B. Health Care Technology Strategy. (2) Two hours of lecture per week. This class will familiarize students with core principles and strategies of decision making related to the development, pricing, distribution and purchasing of biomedical technologies such as biopharmaceuticals and implantable medical devices. Using Bardach’s method for policy analysis, students will analyze current policies and propose policy alternatives with an assessment of the tradeoffs implied in choosing a given policy option over its competitors. (F) Jenkins

223A. Introduction to the Health Care System. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. This is an introductory course that will provide students with an understanding of the structure, financing, and special properties of health services delivery. The course will
analyze the larger management and policy issues that drive reform efforts. (F) Raube

223B. Cases in Health Management. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This is an advanced seminar in health management. It is intended for master’s degree students in the Division of Health Policy and Management who have already completed their field residency. The course consists of analyses and discussions of current problems highlighting cooperation of health managerial issues in health care delivery, E-health, biotechnology, and other health-related organizations. The cases used in the class will provide the student with real-world management problems, choices, and information. The key task for the student is to develop solutions to problems and propose actions using the information in the case. The case discussions will draw on the student’s knowledge of health organizations and current health policies and the skills the student has acquired in operational management, strategic management, ethical analysis, health policy, and interpersonal communication. (F) Rundall

223C. Strategic Management and the Organization of Health Services. (3) Three hours of lecture per week. Prerequisites: Business Administration 205 or 224A or 223A or consent of instructor. Students are required to have a basic background in general business management of the health services system. The overall purpose of this course is to assist the student in managing health care organizations from a strategic perspective. This is a highly interactive, student- and industry-based, organization-wide, group-and individual-level issues in strategy formulation, content, implementation, and performance. Emphasis is placed upon the management role in simultaneously taking into account the wide variety of internal and external factors to improve organization and system performance in meeting the health needs of individuals and communities. Emphasis is also placed on the development and implementation of strategies to meet multiple stakeholder demands, with particular attention given to continuous quality improvement/total quality management approaches. The course will cover a wide range of health care organizations including physician group practices, health systems, hospitals, HMOs, suppliers, pharmaceuticals, and biotechnology companies. The course builds on Business Administration 205, Organizational Behavior, and 223A. Medical Care Organization. (SP) Shortell, Oxendine

223D. Foundations of Health Policy and Management. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing in health policy and management or consent of instructor. This seminar is designed as a first semester seminar for master’s students in the Division of Health Policy and Management. The purposes of this course are fourfold: (1) to provide a framework for understanding of the health care system; (2) to provide an introduction to basic concepts and competencies in health policy analysis and health management; (3) to provide internship preparation and career development activities; and (4) to provide opportunities to develop relationships with first- and second-year HPM students and with faculty, alumni, and healthcare leaders. (F) Oxendine, Solomon

223E. Capstone Seminar in Health Policy and Management. (2) Two hours of seminar per week. Prerequisites: Graduate standing in HPM and completion of 297 seminar. This course is an integrative seminar that builds on the core curriculum requirements of the scholarly foundation courses. The seminar is designed to provide an overview of the key concepts related to health care delivery and management. Students will be expected to demonstrate what they have learned by leading fellow seminar participants in facilitated discussions, discussing in a specific management recommendation or policy position. Students will be required to write an interpersonal report based on the experiences of their peers. Each student is also required to produce a 20-page paper and prepare and deliver a formal presentation to seminar participants and invited faculty. The paper will address an HPM topic of interest that has been selected by the student and approved by the course faculty and the student’s academic adviser. Suggested formats for the paper include a case analysis or strategic management analysis, but other options may be proposed and approved by the instructor. (SP) Solomon

223F. Effective Public Health Negotiations. (2) Hours of lecture/practice per week. The ability to secure enduring agreements is an essential skill for a public health professional. This course will examine organizational and interorganizational dynamics in health care delivery, and the role of public health organizations in the interaction of law, policy, and health care delivery. It will consider the importance of negotiation in everyday practice and in major public health efforts. Topics include the legal and ethical principles and legal reasoning, recurring legal issues confronted by health professionals, and the application and communication of legal principles in the case. The course will cover a wide variety of health care organizations including physician group practices, health systems, hospitals, HMOs, suppliers, pharmaceuticals, and biotechnology companies. The course builds on Business Administration 205, Organizational Behavior, and 223A. Medical Care Organization. (SP) Shortell, Oxendine

224A. Health Care Organizations and Management. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Introduction to health administration, focusing on theories of management, organizations, and environments as they relate to the administration of health care services. Cases, simulation, and structured experiences will be used to tie theory to practice. (SP) Bloom

224B. Cases in Health Management. (3) Three hours of lecture/discussion per week. Prerequisites: 224A or consent of instructor. This course examines major theories and frameworks for analyzing health care organizations. Emphasis is given to the application and testing of theories in the health care sector. Theories to be examined include perspectives on the role of health care in society, health care resource dependency, institutional theory, and theories of change and innovation. The seminar will rely on extensive student participation. (F) Bloom

224D. Doctoral Seminar: Organizational Analysis of the Health Care Sector. (3) Three hours of lecture per week. Prerequisites: One doctoral-level organizational theory course or consent of instructor. This course examines major theories and frameworks for analyzing health care organizations. Emphasis is given to the application and testing of theories in the health care sector. Population ecology, transaction-cost economics, strategic management, and network theories are explored. The seminar will rely on extensive student participant. (SP) Shortell

225. Legal Basis for Health Care Delivery. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. No legal experience or training required. This is a course for non-lawyers in legal and policy analyses of health care, including regulation, fraud and abuse, physician arrangements, Medicare, managed care, privacy, malpractice, patient dumping, health care organizations, contract law, and an appreciation of the interaction of law, policy, and health care delivery. Case studies, including an extended contract negotiation and medical-legal cases, will focus on the application and communication of legal principles in complex but common health care decision-making situations. (SP) Lipman

226A. Health Economics. (3) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: Graduate standing or consent of instructor. This course covers the economics of health and health care. In addition to familiarizing students with the language and tools of health economics, the course will provide an overview of key institutional arrangements and an appreciation of the interaction of law, policy, and health care delivery. Case studies, including an extended contract negotiation and medical-legal cases, will focus on the application and communication of legal principles in complex but common health care decision-making situations. (SP) Lipman

226B. Microeconomics of Health Care Policy. (3) Three hours of lecture and one and one-half hours of discussion per week. Prerequisites: A recent graduate course in microeconomics. A second-level undergraduate course in microeconomics, or consent of instructor. This course examines the economic analysis of the health care system. It examines integration of the health care delivery system and the impact of competition and regulation on providers and patients. Alternative models of health care system reform are presented and analyzed. (F) Dow

226C. Public Health and the Economy. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. An introduction to the literature that suggests that the performance of a regional economy affects the health of the population and vice versa. Controversies in the theoretical and empirical literature are discussed. The implications of the work for public health practice are discussed. (SP) Catalano, Dow

226D. Global Health Economics. (3) Three hours of lecture per week. Prerequisites: Graduate standing or knowledge of health policy and consent of instructor. This class is a survey of different health care systems in western and eastern Europe, the former Soviet Union, Canada, Japan, Taiwan, and China. Other countries will be added to meet the interests of students. The course examines the structure and financing of the health system in each country and assesses the effectiveness, efficacy, and equity of each system. Students will make a presentation on a country’s health system and write a paper. (F) Scheffler

226E. Advanced Health Economics. (3) Three hours of lecture/discussion per week. Prerequisites: Doctoral standing or consent of instructor. This course analyses the health care system through the lens of institutional economics and organization theory. It interprets alternative forms of market contracting and organizational structures as methods of governing transactions in the health care sector. The role of health insurance and health care systems. Theoretical topics include vertical integration, relational contracting and network forms of organization, principal-agent relations, the dynamic capability literature as a guide to innovations and non-profit, for-profit, and public ownership. Applied topics include managed integrated delivery systems, organizational chains and the role of individual medical providers, and public health service organizations. (SP) Robinson

227A. Health Care Finance. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. This course covers strategic financial management in the health services and products industries, including provider organizations, insurance firms, and biopharmaceutical and medical device companies. Cases are used to apply the financial analysis and planning skills learned in the course. Topic areas include financial statement analysis, pricing and service decisions, debt financing, venture capital, equity IPO and public equity markets, risk and return, capital, project risk assessment, mergers and acquisitions, vertical and horizontal integration. (SP) Robinson, Safer

227B. Advanced Health Care Finance. (2) Two hours of lecture/discussion per week. Prerequisites: 227A or a master’s level course in finance. This course covers finance and strategic financial management in the health services and products industry, including provider organizations, insurance firms, and biopharmaceutical and medical device companies. Cases are used to apply the financial analysis and planning skills learned in the course. Topic areas include financial statement analysis, product and service decisions, debt financing, venture capital, equity IPO and public equity markets, risk and return, capital, project risk assessment, mergers and acquisitions, vertical and horizontal integration. (SP) Robinson, Safer

229. Public Health and the Law. (2) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. No previous legal experience or training necessary. This is an introductory course for nonlawyers in selected aspects of the law relating to public health practice. Major areas of fundamental legal principles and legal reasoning, recurring legal issues confronted by health professionals, and the use of law to advance a public health agenda. Emphasis is placed on giving students tools to use when...
they encounter law-related problems in their professional careers. The course is intended for students in all divisions of the School of Public Health. (F) Tu-145, Environ Sci, Policy, and Management

230. Advanced Health Politics. (3) Three hours of lecture/discussion per week. Prerequisites: 220A or equivalent (basic probability and statistics). Health care politics is an interdisciplinary area where social, political, and economic issues intersect with the growing complexity and costs of health care. This course is designed to introduce students to the fundamental concepts and theories underlying health politics. Topics include the political economy of health care, the role of interest groups, and the policy processes involved in the development and implementation of health care legislation. (F) Jointly offered with Public Health C240C. Offered odd-numbered years. (SP) Tarter

C240C. Biostatistical Methods: Computational Statistics and Statistical Medicine. (4) Three hours of lecture and two hours of lab per week. Prerequisites: Statistics 200A-200B (may be taken concurrently) or consent of instructor. This course provides an introduction to computational statistics, with emphasis on statistical methods and software for addressing high-dimensional inference problems in biology and medicine. Topics include numerical and graphical data summaries, loss-based estimation (regression, classification, density estimation), smoothing, EM algorithm, Markov chain Monte-Carlo, clustering, multiple testing, resampling, hidden Markov models, in silico experiments. Also listed as Statistics C245F. Offered odd-numbered years. (F) Van der Laan

C240D. Advanced Biostatistics. (4) Three hours of lecture and two hours of lab per week. Prerequisites: Statistics 220A-220B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

C240E. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A and 200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

C240F. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

C242A. Stochastic Processes in Biology and Health. (3) Three hours of lecture/performance per week. Prerequisites: A course in linear algebra or consent of instructor. Discrete time processes. Topics include linear algebra generating functions; branching process, random walk, and ruin problem; Markov chains; renewal processes and applications in biology and health. Offered even-numbered years. (SP) Chiang

C242B. Biometrical Data Analysis—Pathological Incomplete Data and Pattern Recognition. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 142 and 145 or equivalent, or consent of instructor. Survey of classical methods; mixture, clustered, grouped, incomplete, Cox-model, and truncated data analysis. Offered odd-numbered years. (SP) Tarter

242B. Biometrical Data Analysis—Model-Free Curve Estimation. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 142 and 145, 241, or equivalent courses in basis statistics, linear and logistic regression, analysis of variance, and nonparametric estimation. Expected outcomes: study of linear and nonparametric curve estimation, including bias reduction, and kernel density estimation. Offered even-numbered years. (SP) Tarter

C242C. Longitudinal Data Analysis. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: 142, 145, 241, or equivalent courses in basis statistics, linear and logistic regression, analysis of variance, and nonparametric estimation. This course covers the statistical issues surrounding estimation of effects using data on subjects followed through time. The course emphasizes a regression modeling approach and discussion of general longitudinal modeling and both continuous outcome data/linear models and longitudinal extensions to nonlinear models (e.g., logistic and Poisson). The primary focus is from the analysis side, but mathematical intuition behing the procedures will also be discussed. The statistical/mathematical material includes some survival analysis, linear models, logistic and Poisson regression, and nonparametric estimation. (F, SP) Staff

242D. Biostatistical Methods: Survival Analysis and Causality. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). Analysis of survival time data using parametric and non-parametric models, hypothesis testing, and methods for analyzing censored (partially observed) data with covariates. Topics include marginal estimation of a target, survival, hazard functions using parametric and non-parametric models using the maximum likelihood estimation, and marginal structural models. General theory for modeling locally efficient estimators of the parameters of interest in censored data models. Computing techniques, numerical methods, and general implementation of biostatistical analysis techniques with emphasis on data applications. Also listed as Statistics C245B. Offered odd-numbered years. (SP) van der Laan

242E. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A and 200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242F. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242G. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242H. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242I. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242J. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242K. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242L. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff

242M. Statistical Genomics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Statistics 200A-200B or equivalent (may be taken concurrently). A course in algorithms and knowledge of at least one computing language (e.g., R, MATLAB) is recommended. Genomics is one of the fundamental areas of research in the biological sciences and is rapidly becoming one of the most important application areas in statistics. This is the first course of a two-semester sequence, which provides an introduction to statistical and computational methods for the analysis of microarray and sequencing gene expression data. Students will be expected to work collaboratively with statisticians to interpret and critique applications in the HPM literature. (SP) Staff
matched pairs analysis, maximum likelihood estimation will focus on advanced R techniques specifically is to provide a package of statistical techniques along these are descriptive methods, simulation techniques, often aims to learn and test many univariate characteristics which relies on general cross-validation methodology to select among candidates; and a final report in a style for a publishable manuscript. Three hours of lecture and one hour of laboratory per week. Prequisites: 250A; 145 or 241B concurrently; Three hours of lecture per week. Prequisites: 240D or consent of instructor. Statistical computer-intensive methods have become an integral part of the tool box of biostatistical and longitudinal studies involving the collection of genomic data such as gene expression, single nucleotide polymorphism, and comparative genomic hybridization measurements across tissue. These data structures are extremely high dimensional and the characteristics (parameters of interest) of the population are complex (high dimensional), and outcomes such as survival are often subject to censoring. In addition, one often aims to learn and test many univariate characteristics simultaneously (e.g., regression coefficient for each gene). This course will present: (1) a unified loss function approach to learning from the data such characteristics which relies on general cross-validation methodology to select among candidate estimators; (2) resampling-based multiple testing methods controlling type I errors; and (3) clustering methods embedded into a statistical framework. Also listed as Statistics 242BC. (F) van der Laan

248L. Epidemiologic Methods Laboratory. (2) Two hours of lecture per week. Prequisites: 248 or consent of instructor. This course will emphasize realistic applications of data analysis methods and is aimed at, though not limited to, students taking 252. Instruction will focus on advanced R techniques specifically applied to epidemiologic data through analysis of data sets using logistic regression, Poisson regression, marginal structural models, maximum likelihood estimation, and survival analysis techniques. (SP) Selvin

250A. Epidemiologic Methods I. (3) Three hours of lecture and one hour of discussion per week. Prequisites: 142 may be taken concurrently. Principles and methods of epidemiology: study design, selection of cases and controls, exposure data collection, analysis, and inference. Discussion session provides an opportunity to apply methods to problem sets and to discuss issues presented in lectures. (SP) Spiegelman, Smith

250B. Epidemiologic Methods II. (4) Four hours of lecture and two hours of laboratory per week. Prequisites: 250A or an equivalent introductory course in epidemiology or advanced degree (M.D., Ph.D., D.V.M.) in a biomedical field. This course is intended as an intermediate-level course in the field of epidemiology. Topics include causal inference; measurement of disease rates; inferential reasoning; and regression and testing enabling econometric, case-control, cohort, intervention trials, and meta-analytic designs (potential sources of bias, confounding, and effect modification in each research design are explored in detail). Empirical epidemiology including the use of likelihood ratios, receiver operator curves, and the sensitivity, specificity, predictive value of a test; and a brief introduction to logistic regression, survival analysis, and decision analysis. The readings from this course are drawn primarily from advanced epidemiology textbooks (Kleinbaum, Rothman, Miettinen). The course is intended to provide a firm foundation for what will soon be covered in 250C. (F) Ahern or Colford (alternating years)

250C. Epidemiologic Theory. (4) Four hours of lecture and two hours of practicum per week. Prequisites: 241, 245, 250B, or consent of instructor. This course is a continuation of 250B. The course covers sampling issues that reveal them in greater breadth and depth. Topics that follow from 250B include causal inference; the interrelation between measures of disease frequency; the theory that underlies case-control studies and the practical issues that relate to implementation of case-control studies; and further exploration of the quantitative aspects of bias, confounding, propensity scores, and their inter-relation. The first part of the course develops the theory of ecological studies and mixed model analysis also are provided. Readings are primarily from the epidemiologic methods literature, and problems are based on the evaluation of published data. The course is divided into two parts: (1) two hours of lecture to a depth of 1-4 weeks: causal inference/models of causality; epidemiologic measures of disease occurrence and their inter-relations; standardization of rates; bias and validity—causal and non-causal; classification/measurement error; confounding; matching; case-control studies; ecological studies. (SP) Tager

251A. Practicum in Epidemiologic Methods I. (4) Three hours of lecture and one hour of laboratory per week. Prequisites: 250A, 145 or 241B concurrently; consent of instructor. A two-semester sequence intended for students in the Epidemiology/Biostatistics MPH Program and other qualified graduate students. This is a practicum course in research design data analysis. Students select a research question and learn practical skills to analyze a large database in order to answer the research question. The course teaches students to design and perform univariate and multivariate analyses; students also learn critically to review scientific literature. Students are required to complete computer assignments, an oral presentation of a literature review with handouts for class, a final presentation (as would be presented at a scientific meeting), and a final report in a style for a publishable manuscript. (SP) Eskensazi

251C. Causal Inference and Meta-Analysis in Epidemiology. (2) Two hours of lecture per week. Prequisites: Students in the 250B course of the second year of the Epidemiology/Biostatistics Master’s of Public Health Program. (Students from other programs welcome.). This course will review the theoretical aspects of causal inference, meta-analysis, and meta-analysis, but its focus will be more on the practical aspects of these topics that are not commonly found in textbooks or presented in classes on epidemiologic theory. It is hoped that the student develops the day-to-day skills necessary to complete and present a well-documented, accurate, and thorough review of epidemiologic literature. (F) A. Smith, Steinmaus

251D. Applied Epidemiology Using R. (2) Two hours of lecture per week. The purpose of this course is to introduce the R programming language for applied epidemiology. R is a freely available, multi-platform (Mac OS, Linux, and Windows, etc.), versatile, and powerful statistical computing and graphics (r-project.org). This course will focus on core basics of organizing, managing, and manipulating epidemiologic data; basic epidemiologic application; introduction to R programming; and basic R graphics. (F) Aragon

252. Modeling the Dynamics of Infectious Disease Processes. (2-4) Two hours of lecture and three hours of laboratory per week. Prerequisites: Math 240A, 249 (or similar course covering multivariable linear and logistic regression analysis), or epidemiology students, 250C or consent of instructor. This course will cover the basic tools required to both critically read modeling papers and to develop and use models as research tools. You will learn how to use R to understand infectious disease processes and to evaluate potential control strategies. The class meeting will consist of both lecture material covering conceptual issues and a computer lab to apply these concepts using standard infectious disease models. (SP) Porco

252C. Intervention Trial Design. (3) Three hours of lecture per week. Prequisites: 245 and 250A (may be taken concurrently). Students learn (through lectures and graded student presentations and projects) to design clinical and population-level field trials. Topics: formulation of a testable hypothesis; identification of appropriate populations; binding (including indices for assessment and their inter-relations; standardization of rates; bias and validity—causal and non-causal; classification/measurement error; confounding; matching; case-control studies; ecological studies. (SP) Tager

252D. Introduction to Causal Inference. (4) Two hours of lecture and two hours of discussion per week. Prequisites: 241 or C240A (can be taken concurrently); 245 or similar course covering multivariable linear and logistic regression analysis; for epidemiology students, 250C or consent of instructor. This course presents a general framework for causal inference using directed acyclic graphs, non-parametric structural equation models, and counterfactuals. Marginal structural models and causal effect estimation using inverse probability of treatment weighting, G-computation, and targeted maximum likelihood are introduced. In two-part presentations, students will define and implement research questions. (F) Petersen

253A. Topics in Disease Surveillance. (2) Two hours of lecture per week. Prequisites: Graduate standing or consent of instructor. Ways of doing surveillance correctly and non-conductively, and how the reasons for doing surveillance determine the system selected; and how to evaluate whether or not a given surveillance is providing the data needed to meet objectives. (F) Rutherford

253B. Epidemiology and Control of Infectious Diseases. (3) Three hours of lecture/discussion per week. Prerequisites: Prior determination of compatibility with biomedical sciences and consent of instructor. A discussion of...
major infectious diseases with emphasis on disease prevention, investigatory procedures, and treatment programs. Emphasis is on current problems in health agencies at a state, national, and international level. (SP) Reingold

253C. An Overview of the AIDS Epidemic. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. The aim is to understand the origin, transmission, and natural history of AIDS and the opportunties that the spread of the virus presents, especially the dynamics and the timing of possible preventive measures. The course compares the cost of care and prevention and analyzes the social and political influences on the way epidemics are treated. Specific requirements for this paper will be distributed during the third class session. (F) Ekstrand, Morin

253E. Ethical Challenges in Public Health Interventions: Catastrophic and Routine. (2) Two hours of lecture per week. This course aims to enhance course participants’ abilities to articulate and examine ethical issues surrounding responses to public health/healthcare challenges whether routine or during catastrophic discussions will be based on presentations and assigned readings for the class, and without expectation that students will incorporate their own diverse views and approaches to moral and logistical challenges. (SP) Kayman

253F. Foundations of Public Health. (2) Two hours of seminar per week. The seminar will introduce core disciplines and concepts in public health, using a case-based, integrated approach. Examples of cases discussed will include respiratory disease and air pollution; tobacco control and prevention of smoking-related conditions; disease elimination or eradication via childhood immunization; environmental control and prevention of schistosomiasis; behavior change and prevention of HIV/AIDS, and novel economic approaches to increasing delivery to impoverished groups. (SP) Reingold, Smith

254. Occupational and Environmental Epidemiology. (3) Three hours of seminar per week. Prerequisites: 250A. Formerly 254B. Epidemiological methods for designing, conducting, and interpreting epidemiological studies of persons occupationally or environmentally exposed to chemical and physical agents. (SP) A. Smith

255A. Social Epidemiology. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. This course is designed to introduce students to the field of social epidemiology and its role in understanding the social determinants of population health and health inequalities. The course will present a systematic and detailed overview of literature in the field covering the history and development of the field of social epidemiology, theoretical perspectives, major topical areas and research approaches, controversy over definitions of social epidemiology, and controversies related to theory, research methods, and research findings. This course will be distributed throughout the course: (1) the ecological model, (2) the life course approach, (3) causality. These three principles will provide a framework for the critical analysis of scholarly journal articles and the synthesis of information across content areas. This is a breadth course intended to provide an overview of the field of social epidemiology and expose students to relevant areas of study. This is not a Methods course. (SP) Nu-n-jeter

255C. Mental Health and Psychopathology. (3) Three hours of seminar per week. Prerequisites: Open to doctoral students or with consent of instructor. This doctoral seminar is designed to provide an understanding of the complex (and often interactive) individual and environmental conditions that increase the risk of psychological disorders throughout the life span. We will start by learning about general concepts important to an understanding of psychopathology and prevention of psychopathology, including the concepts of resilience, an immediate response, and different levels of preventive interventions. For each different area of psychopathology, we will consider: (1) the core feature of disorder; (2) key theory to psychopathology and epidemiology; (3) causes of disorder, with a particular emphasis on understanding the range of risk and protective factors on the individual, family, and community level; and (3) the implications of etiological understanding for public health efforts to prevent the particular disorder. (F) Ozer

255D. Methods in Social Epidemiology. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. This course is designed to review, evaluate, and apply methods currently used in social epidemiology. The course aims to teach approaches to forming clear research questions, and selecting the best method(s) to answer the questions posed. Initially, we will discuss approaches to developing detailed epidemiologic conceptualizations. We will then discuss recent controversies around the meaning of questions posed in social epidemiology, and the ability of currently used methods to answer questions in social epidemiology. Finally, we will review, evaluate, and apply a range of different methods that are or could be used to answer questions in social epidemiology, again emphasizing the types of questions each method is best suited to address, and their ability to address the challenges to effectively answering questions in social epidemiology. There will be a mixture of lecture and research questions on the topic, with student participation and questions strongly encouraged. (SP) Ahern, Hubbard

255E. Structural Inequalities and Reproductive Health. (2) Two hours of seminar per week. Prerequisites: 250A or equivalent, background in reproductive health. This course will address the role that structural inequalities assume in shaping reproductive health disparities. We will examine relevant epidemiological research, review and critique public health interventions, and discuss how research in this area can inform policy. This course will cover three modules, each linked to reproductive health: poverty, gender-based violence, and migration. Within each module, students will examine measurement, research design, and ethical challenges. (SP) Dunbar, Kriehnan, Minnis

255F. Molecular and Genetic Epidemiology and Human Health in the 21st Century. (4) Two hours of lecture, one hour of laboratory (wet/exp), journal review per week. Prerequisites: College-level biology course or consent of instructor. Introductory bio-statistics recommended. This course will cover basic principles of human/population genetics and molecular biology relevant to understanding approaches to disease. The course will adopt a genome-wide approach to genome-wide association studies; application of biomarkers to define exposures; recent developments in genomics, epigenetics and other-omics, including next generation sequencing technology and genomics in personalized medicine and health. Hands-on computer and wet laboratory will provide experience with modern research tools. (F) Barcellos, Holland

257. Outreach Investigation. (2) Two hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: 250A or equivalent. This is an introductory course in epidemiologic methods that will teach students why and how clusters of illnesses/epidemics are presented. Methods and approaches relevant to the course will be discussed, including published articles from the scientific literature to provide examples. (SP) Reingold

257A. Disaster Epidemiology: Methods and Applications. (2) Two hours of lecture per week. This course is an introduction to disaster epidemiology. Epidemiologists play an important role in assessing the health effects of natural and man-made disasters and in identifying the factors that contribute to these effects. The emphasis of this course will be on the application of basic epidemiologic methods to the study of the health consequences of disasters with the purpose of identifying lessons learned from previous disasters; highlighting key skills that an epidemiologist would need to possess and how they apply to identifying and addressing the health consequences of many different types of disasters. (SP) Aragon, Enanoria

257B. Public Health Preparedness and Emergency Response. (3) Two hours lecture/discussion per week. Prerequisites: Completion of one semester of graduate public health curriculum or in public health practice. This one semester course is an intensive introduction to public health emergency preparedness and response, and covers the following topic areas: the role of public health in disasters, natural disasters and severe weather, intentional mass threats (CBRNE), detecting and monitoring public health threats, post-disaster sampling, surveys, rapid needs assessments, public health emergency incident management system, and multi-agency operations planning and contracts. (SP) Aragon

258. Epidemiology of Neoplastic Diseases. (3) Three hours of lecture per week. Prerequisites: 150A or 250. For students with a basic understanding of epidemiology, biostatistics, and tumor biology. An introduction to the epidemiology of some major site-specific cancers, with emphasis on understanding the factors that contribute to the study of their causation, and implementation will be discussed. (F) Buffler

258B. Ethical Issues in Epidemiology Research. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. This course will teach students why and how clusters of illnesses/epidemics are presented. Methods and approaches relevant to the course will be discussed, including published articles from the scientific literature to provide examples. (SP) Reingold

259A. History of Epidemiology. (3) Three hours of lecture per week. Must be taken on a satisfactory/unsatisfactory basis. This course traces the development of epidemiological methodology and theory from the "Golden Age" of Greece in the sixth century B.C. to modern practice at the turn of the 21st century. Consideration will also be given to historical events such as major epidemics and important research activities. The course provides students preparing for academic careers in epidemiology the background to teach and research the field. Case studies will be a major vehicle for assessing the course objectives. Original readings will be discussed. (F) Buffalo

259B. Practical Applications of Epidemiologic Methods in Developing Countries. (3) Three hours of lecture per week. Practical application of epidemiologic methods in the developing world, including surveillance, surveys, case-control studies, and intervention trials. The applications of these methods to the study of infectious and non-infectious diseases will be presented. (SP) Winkelstein Jr.

260A-260B. Principles of Infectious Diseases. (4/4) Four hours of lecture per week. Prerequisites: Upper
division course preparation in biology. This course presents general principles of microbial interactions with humans that result in infection and disease. Course content is developed using examples of viral, bacterial, and parasitological pathogens that exemplify mechanisms of infectious disease. The epidemiology, pathogenesis, host response, diagnosis, treatment, and control will be explored for each infectious disease discussed. (F,SP) Riley, Swartzberg

260C. Infectious Disease Laboratory. (2,4) Two hours of lecture and six hours of laboratory per week. This course is split into two modules, each seven and one-half hours per week. Students may take a single module for 2 units. Prerequisites: 260A or consent of instructor. Module I: Practice in standard techniques for the isolation, identification, and characterization of infectious agents. This module will be worth 2 units. Corequisite: 260D. Students with an appreciation and understanding of the complex issues involved in conducting scientific, laboratory-based investigation in developing countries. We will discuss the many obstacles to establishing and sustaining research projects, such as poor infrastructure, insufficient financial and material resources, and lack of scientific information and interaction. More importantly, we will identify innovative solutions to overcoming these obstacles. The first half of the course will consist of presentations by U.S. and developing countries investigators who have long-term research experience in Latin America, Asia, Africa. We will also discuss related issues such as ethical considerations, equitable collaborations, research capacity strengthening. During the second half of the course, students will give presentations on topics of their choice. Offered alternate years. (F) Harris

261. Advanced Medical Virology. (3-4) Four hours of lecture/discussion per week. Prerequisites: Consent of instructor. Analysis of viral and host factors that play a role in viral diseases of medical importance. 4 units of credit are available to students who write a research proposal on a topic other than that proposed for their dissertation. (SP) Liu

262. Molecular and Cellular Basis of Bacterial Pathogenesis. (3) Three hours of lecture/discussion per week and one hour of literature review. Prerequisites: 260A, 260B, or consent of instructor. This course for graduate students will explore the molecular and cellular basis of bacterial pathogenesis. The emphasis will be on model bacterial pathogens of major importance. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions. Students enrolled in 262 also will be required to attend a discussion of the primary literature, both current and classic. Each student will be required to present one paper. (SP Portnoy

263. Public Health Immunology. (3) Students will receive no credit for 263 after taking Molecular and Cell Biology 150. Three hours of lecture per week. Prerequisites: 260A (prior or concurrent). Graduate standing. Public health majors by consent of instructor. This course will be the principal immunology course for students in the MPH program designed to teach both the basic biology of the human immune system and its response in health and disease, especially the specific response of the human immune system to vaccines. The topics to be explored: (1) components of the immune system (spectrum of cell types and cell products); (2) different arms of the immune system including humoral, cell-mediated, and innate immunity; specificity of immune response to infection caused by viral, bacterial, fungal, and parasitic pathogens; and (4) disorders of the immune system unrelated to infectious disease. Through this course, students should not only gain a basic understanding of the human immune system, but also learn the functions and responses of the human immune system to diseases of infectious and non-infectious nature, and the relevance of these interactions in the context of public health problems. (F) Riley

264. Current Issues in Infectious Diseases. (2) One hour of lecture and one hour of discussion per week. Prerequisites: Second-year Infectious Diseases MPH students only. Formerly 264A-264B. Examination of scientific, social, and policy dimensions of issues involving infectious diseases. Students select one topic for in-depth analysis and present findings in a public debate. Topics vary from year to year. (F,SP) Slessard

265. Molecular Parastisology. (3) Course may be repeated for credit. Three hours of lecture and two hours of discussion for 10 weeks. Prerequisites: Upper division courses in molecular biology, parasitology, biochemistry, immunology, microbiology, or consent of instructor. Familiarity with reading primary research is recommended. Advanced course in the molecular aspects of parasite immunology, molecular biology, genetics, and bioinformatics. For each parasite, the following areas will be covered: biology; disease spectrum; epidemiology; pathogenesis, immunology; and vaccine development. The lectures will focus on "state-of-the-art" in relation to molecular mechanisms of pathogenesis, parasite adaptations for survival within the host, and strategies for drug and vaccine development and disease control and prevention. Content will remain heavy on current literature. (F) Harris

266. Viruses and Human Cancer. (3) Three hours of lecture per week. Prerequisites: Course in basic virology or microbiology. Topics include the molecular biology of tumor viruses; mechanisms of viral carcinogenesis; clinical characteristics of tumors arising from virally transformed cells; the epidemiology, pathology, diagnosis, treatment, and prevention of virally caused cancers; problems of proving the etiology of viral diseases. Prerequisite is a knowledge of basic virology. Offered even-numbered years. (SP) Buehner

266A. Foodborne diseases. (2) One and one-half hours of lecture per week. Prerequisites: Basic knowledge of microbiology. This course will cover public health, microbiological, social, and economical issues related to foodborne diseases. Three areas will be explored: (1) categories, clinical manifestations, and disease processes of foodborne illnesses; (2) etiological agents causing foodborne illnesses, and (3) diagnosis and control of foodborne illness. The course will discuss different types of foodborne diseases, clinical manifestations, and the interactions between etiological agents (pathogens and non-pathogens) and host. We will cover pathogens that are the most frequently associated with foodborne illness including bacterial and viral pathogens such as Salmonella, E. coli, hepatitis viruses and Norwalk-like gastroenteritis agents. We will also study non-bacterial pathogens such as heavy metal, pesticide, and toxic chemicals. Furthermore, the course will discuss how to identify the etiological agents in outbreaks and possible measures to be taken to minimize the risk to the public including vaccines and education. Finally, we will explore the social and economic issues involved in the food production, distribution, and consumption. This course will contribute to foodborne diseases. (F) Lu

267B. Characterization of Airborne Contaminants. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing in environmental health science. This course is designed to acquaint students with the use of air monitoring methods in industry and the environment. Topics include behavior of gases, vapors, and aerosols; mechanisms of absorption and elimination of inhalable toxicants; methods for measuring of airborne chemicals and particles. (SP) Hammond

267D. Health Impact Assessment. (3) Three hours of lecture per week. Health Impact Assessment (HIA) refers to a diverse set of analytic and communicative practices that aim to inform and improve social decision-making in order to improve public health, economic, and social conditions required for optimal population health. This course provides an introduction to HIA with a focus on the need for and application of this methodology for analysing and developing the objectives of the course include understanding and comparing the range of practices used to conduct Health Impact Assessments in the United States and internationally; identifying the opportunities and obstacles for using the environmental impact assessment as vehicles for health analysis; and development and application of environmental health assessment tools to inform decision making as part of a class project. (SP) Soto

C269C. Occupational Biomarkers. (4) Three hours of lecture/fieldwork per week. Overview of ergonomics and occupational biomechanics. Course covers pathophysiology and risk factors of upper extremities and back, load management of force and posture, models for risk assessment, anthropometry applied to task and workstation design, tool design, and structure of successful ergonomics programs. Students will develop a detailed job analysis and design a workplace intervention. Also listed as Bioengineering C279. (SP) Rempel

269D. Ergonomics Seminar. (2) Two hours of lecture per week. Prerequisites: 269C or consent of instructor. Readings and lectures in occupational biomechanics. Course materials will be covered. Topics include: injury, job design and joint biomechanics, material handling models, mechanisms of injury, hand tool design, and instrumentation issues. Students will prepare critical reviews of recent publications and design an intervention to reduce work-related risk factors. Offered alternate years. (F, Rempel

269E. Current Topics in Environmental Medicine. (2-3) Two to three hours of lecture per week. Topics in environmental medicine will provide students with an overview of the health impacts of environmental mechanisms, and public health controversies related to selected environmental exposures. The course will cover established environmental diseases as well as impacts of some emerging exposures of concern. The focus will primarily be on pathophysiology, issues related to exposure pathways, and the susceptibilities of specific human populations. No prior medical knowledge required. (F, Harrison, S. R.

270. Introduction to Environmental Health Sciences. (3) Three hours of lecture and two hours of discussion per week. Prerequisites: One epidemiology course; one biostatistics course (may be taken concurrently). This survey course covers the breadth of hazards to chemical, biological, and physical agents of concern to environmental health professionals. Lectures are presented by experts on particular topics that emphasize the activities involved in professional practice. Students will also meet twice monthly with the instructor to discuss advanced readings and assignments related to the lecture topics. Students will conduct a project on a topic of current interest in some aspect of environmental health (under the guidance of the instructor). This course is designed for MPH students in environmental health sciences and other graduate-level students interested in an overview of environmental health sciences. (SP) Pathak

270A. Exposure Assessment and Control. (3) Three hours of lecture per week. Prerequisites: Graduate standing in the School of Public Health or consent of instructor. Direct and indirect methods and procedures for the estimation and control of human exposure to...
C270B. Advanced Toxicology, (3,4) Three to four hours of lecture per week. Prerequisites: Nutritional Science and Toxicology 110 for 3-unit option. The application of toxicology to answer questions about safety and risk. Using a case-study approach, participants will learn how to interpret toxicological data and apply their knowledge to evaluating the risk presented by exposures to toxic chemicals, including drugs and environmental hazards. Discussion will focus on current topics of controversy in the field of toxicology. Also listed as Nutritional Science and Toxicology C219. (SP) Smith

270C. Practical Toxicology. (2) Two hours of lecture/discussion per week. Prerequisites: 270B or Nutrition Science and Toxicology 110 or equivalent course in toxicology. This course will focus on cutting-edge issues involving real-world toxicology in drug discovery, pesticide regulation, stem cell research, etc. Many well-known toxicologists, researchers, and practitioners from pharmaceutical companies, petroleum industry, private consulting firms, nonprofit institutes, and federal and state regulatory agencies in the Bay Area will be invited to lecture to students. Some of the speakers are our school’s alumni who understand exactly what our students need to know before entering the real world. Learning outside the classroom will be another major focus of the class, from other existing toxicology courses offered at Berkeley. This new class will provide students a chance to visit some of the real-world sites allowing students to see and feel what they are learning. In addition to preparing our students for the real world, we will use combined teaching/learning styles including lecture with discussion sections, site-visits, hands-on experiences in a toxicology laboratory, and student group assignments or projects. (SP) Zhang

271B. Reproductive Hazards of Industrial Chemicals. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. The scientific knowledge necessary to assess the hazards of chemical exposure to human male and female reproduction. Includes the effects of exposures in the environment. Nonchemical hazards to reproduction (e.g., radiation) are not discussed. (SP) Eskenazi

271D. Global Burden of Disease and Comparative Risk Assessment. (3) Three hours of lecture/discussion per week. Prerequisites: Graduate standing or consent of instructor. Introductory epidemiology (250A or equivalent) is recommended. The Global Burden of Disease (GBD) database utilized by who provides estimates of illness, injury, and death by disease type, age, sex, and world region in a consistent and coherent manner. The course will explore the ways such a detailed database is possible a wide range of new types of analysis of health priorities and the relationship of database will also be introduced. This seminar will also provide an opportunity for reading and discussion of recent publications, data limitations, and methodological difficulties of the GBD. It is intended to be a true seminar relying heavy on class participation. The homework assignment will be greatly facilitated by use of computer spreadsheets. (SP) K. Smith

271E. Science and Policy for Environment and Health. (3) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor. Scientific knowledge and analyses are important to the development of public policies that address the impact of the environment on health. The limits of existing knowledge and uncertainties in research results create significant challenges in applying science to action. This course critically examines how scientific information is used in policy decisions. Case studies of current issues address characterization of scientific knowledge, interpretation of science in policy contexts, scientific integrity, and multipathway decision making that influence decisions. Assignments prepare students to effectively translate technical knowledge for multidisciplinary and lay audiences and to participate in decision-making discussions. Students address differences between regulatory and market-based approaches; emerging paradigms including the precautionary principle and environmental justice; and key elements of risk assessment and cost-benefit analysis. (SP) Kyle

271F. Public Health and the Built Environment. (2,3) Two hours of lecture per week. Prerequisites: Graduate student standing. An interdisciplinary course on the built environment and health. The United States and other developed countries are facing increasingly lethal and costly epidemics of acute and chronic diseases related to land use and built environment decisions. While the hazards presented by air and water pollution are well recognized for acute, infectious, and toxicological illnesses, there is only now increasing recognition of the hazards presented by building and community design that fail to recognize human health. Land use and built environment decisions impact every age group, social, and racial minority. These impacts range from the very acute (motor vehicle trauma) to the long term (obesity, cancer, heart disease). Issues we will have as their bases economic, financial, insurance, housing, and other factors. Participants in the sessions would analyze each of these factors and related disease endpoints. (F) Jackson

271G. Global Environmental Change for Health Scientists. (1,2) Two hours of lecture and one hour of discussion per week. Prerequisites: An introductory course in epidemiology is strongly suggested. The course will first provide a basic foundation in the physical and ecological basis of climate change, including atmospheric structure and feedbacks, carbon cycling, and the sources and trends of human and natural greenhouse pollutant emissions. Forecasts of future climate— and their uncertainties — will be discussed, emphasizing parameters of potential relevance to human health. We will explore epidemiologic, risk assessment, and statistical methods appropriate for understanding the impact of climate on health in different populations, including reviews of current burden of disease estimates of avoidable and attributable risk. The public health implications, positive and negative, of climate change and its impacts will be discussed. The impact of climate change will be elaborated, including discussions of ethical, political, and economic aspects. The 1-unit version ends before the spring break. Students in the 2-unit version will prepare a term paper and be responsible for formal class presentations summarizing and critiquing the evidence based on a health outcome related to climate change. (SP) Jarrett, Smith

272A. Geographic Information Science for Public and Environmental Health. (4) Two hours of lecture and two hours of laboratory per week. Prerequisites: Introductory statistics course or equivalent. Geographic information systems (GIS) have emerged as an important tool for performing health and environmental analyses. GIS is a spatial analysis system for the organization, storage, retrieval, and analysis of data for which the location and other spatial attributes are considered important (e.g., incidence of a specific disease condition in relation to a pollution source). GIS also encompasses the organizational structure, personnel, software, and hardware needed to support spatial analysis. For many health and social scientists, GIS has become a new lens for viewing their work. The course will provide students with an introduction to this exciting and expanding field of inquiry. On successful completion of the course, you should possess the following skills and knowledge: (1) a basic understanding of geographic and cartographic concepts that underlie GIS; (2) working knowledge of ArcGIS, a powerful "desktop" GIS software package that runs in a Windows environment; and (3) introductory knowledge of past, present, and possible future applications of GIS for health and environmental studies. (SP) Jerrett

272B. Case Studies in Environmental and Occupational Epidemiology. (3) Three hours of lecture per week. Prerequisites: 250C and 241. Using published studies as examples, we will focus on epidemiologic methods as they arise in the study of environmental hazards in the community and workplace. Selected topics include the validity of exposure assessment for both commensurate and occupational studies, specific forms of selection bias (e.g., healthy worker survivor effect), measurement error (e.g., exposure misclassification), time varying confounding, and other methods to model exposure and disease. We will also present selected issues involving real-world toxicology in drug development and utilization. Latest developments in recombinant vaccine technology, vaccine delivery systems, "naked DNA" vaccines, "designer" vaccines, new adjuvants, and cell and tissue engineering will be discussed and covered. Offered alternate years. (SP) Riley, Enarnoura

275. Current Topics in Vaccinology. (2) Two hours of lecture per week. Prerequisites: 250A, 250B, and 264 or consent of instructor. This is an advanced-level course designed to cover current related to the biological and analytical aspects of vaccine development and utilization. Offered odd-numbered years. (F) Stephens

276. Public Health and Spirituality. (1) Two hours of seminar per week for eight weeks. Prerequisites: Completion or concurrent enrollment in at least one other course in public health, or consent of instructor. This course presents a brief introduction to the emerging field of spirituality and public health. We examine scholarly and popular关羽 links between spirituality, religion, and health. Topics include an overview of the rapidly emerging scientific evidence base, public health relevance, collaborations with faith-based organizations, and other practical applications. (SP) Omura

282. Topics in the History of Medicine and Public Health. (2,3) Course may be repeated for credit with consent of instructor. Two hours of seminar per week. Prerequisites: Consent of instructor. A series of lectures and seminars providing detailed scrutiny of selected topics in the history of medicine, public health, and the allied health sciences. The precise content will vary from year to year and may reflect, in part, topics of class interest. Students electing to take the course for 3 units will be assigned a research topic. (F,SP) Hook

C285. Traffic Safety and Injury Control. (3) Students will receive no credit C285 after taking Civil and Environmental Engineering C291A. Three hours of lecture per week. Prerequisites: Environmental Engineering 262 or equivalent. This course applies principles of engineering, behavioral science, and vision science to preventing traffic collisions and subsequent injury. A systematic approach to traffic safety will be presented in the course, and will include: (1) human behavior, vehicle design, and roadway design as interacting approaches to preventing traffic crashes; (2) vehicle crashes as approaches to preventing injury once a collision has occurred. Implications of intelligent transportation system concepts for traffic safety will be discussed
throughout the course. Also listed as Civil and Environmental Engineering C265. (SP) Ragsland

285A. Public Health Injury Prevention and Control. (2) Two hours of lecture per week. Prerequisites: Consent of instructor. Injuries are a major and often neglected public health problem with substantial human and economic costs. Injuries are the leading cause of death from the first year of life to age 45, and the leading cause of lost potential years of life. This course provides a perspective on the conceptual framework within which to consider injuries (both intentional and unintentional) as social and public health problems. Through review of epidemiology and intervention studies, students will consider the causes and consequences of traumatic injury within developmental, social and economic contexts. Particular emphasis is placed on alternative strategies for injury prevention and on the relative benefits of intervention at different levels. (F) Ragsland

288A. Preventive Medicine Residency Seminar: Public Health Practice. (1) Two hours of seminar per week for eight weeks. Prerequisites: M.D. or medical student. This seminar is required for preventive medicine residents but is also open to other physicians and medical students interested in preventive medicine and public health practice. It provides an overview of preventive medicine practice, especially through the experiences of the affiliated Behavioral, Preventive Medicine examination in public health and general preventive medicine. The objectives of this seminar are to review basic organization, principles, and practices of health as they relate to public health practice in governmental public health agencies and to describe the role of the preventive medicine physician in several subspecialties within public health practice. Jack Glaser, Ph.D.

288C. Preventive Medicine Residency Seminar: Managed Care and Preventive Medicine. (1) Two hours of seminar per week for eight weeks. Prerequisites: M.D. or medical student. This seminar is required for preventive medicine residents but is also open to other physicians and medical students interested in preventive medicine and public health practice. It provides an overview of preventive medicine practice, especially those areas covered by the American Board of Preventive Medicine examination in public health and preventive medicine. The objectives of this seminar are to review basic principles and practices of health care organization and financing, quality assurance, clinical practice guidelines, preventive services and healthcare delivery for the underinsured and to describe the role of the preventive medicine physician in health care organizations. (SP) Rutherford, Seward

288D. Preventive Medicine Residency Seminar: Public Administration. (1) Two hours of seminar per week for eight weeks. Prerequisites: M.D. or medical student. This seminar is required for preventive medicine residents but is also open to other physicians and medical students interested in preventive medicine and public health practice. It provides an overview of preventive medicine practice, especially those areas covered by the American Board of Preventive Medicine examination in public health and preventive medicine. The objectives of this seminar are to review basic principles and practices of public health, as well as the roles of professionals in the public health system. (F) Rutherford, Seward

290. Health Issues Seminars. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Sections offered for 1 unit will be offered as satisfactory/unsatisfactory. Sections offered for 2 to 4 units will be letter graded. A discussion of current developments and issues in public health of interest to faculty, students, staff, and the department at large. Content varies from semester to semester, depending upon current issues and interests. (F,SP) Staff

291A. Preparation for Public Health Practice. (1) Two hours of workshop per week. Must be taken on a satisfactory/unsatisfactory basis. Formerly 291. A series of skills-based workshops designed to introduce the student to specialized skills needed in the public health workplace. These workshops are designed to complement the Public Health Practice requirement. Use of local resources to promote the training of public health practitioners, and students. Workshop facilitators include consultants, CPHP field supervisors, and public health practitioners with expertise in the subject. This course or series of workshops is open to all M.P.H. and Dr.Ph. students. The student selects from a list of two-hour workshops to total 1 unit equivalent to 15 hours of class time, plus readings that are assigned for many of the workshops. Workshop topics have included writing for publication, moderating focus groups, human resources management, legislative policy and advocacy, negotiation, evaluation, tools for financial planning, and scientific grant writing, leadership, oral presentations, strategic planning, cultural competency, time management, and budgeting. (F,SP) Field Studies Program Staff

292. Seminars for M.P.H. Students. (1-4) Course may be repeated for credit. One to four hours of seminar per week. Sections 1-8 to be graded on a letter-grade basis. Sections 9-16 to be graded on a passed/not passed basis. Current topics and special issues in the health field. (F,SP) Staff

293. Doctoral Seminar. (1-4) Course may be repeated for credit. Two hours of seminar per week. Sections 1-8 to be graded on a letter-grade basis. Sections 9-16 to be graded on a passed/not passed basis. Discussion and analysis of dissertation research and the doctoral degree as a whole. Particular emphasis is placed on alternative strategies for injury prevention and on the relative benefits of intervention at different levels. (F,SP) Staff

294. Post-Residency Seminar. (2-3) One hour of seminar per week. Prerequisites: Supervised residency in public health practice. Comparative analysis of field experiences as related to academic work, theoretical and practical issues in public health, and professional practice in the student’s chosen public health discipline. Emphasis upon integrity, social and ethical issues, and the role that the student wishes to achieve in his or her professional development. (F,SP) Staff

295. Seminars. (1-4) Course may be repeated for credit. One to four hours of seminar per week. (F,SP) Staff

296. Special Study. (1-10) Course may be repeated for credit. One to four hours of seminar per week. (F,SP) Staff

297. Field Study in Public Health. (1-12) Must be taken on a satisfactory/unsatisfactory basis. Supervised experience relevant to specific aspects of public health practice in governmental public health agencies, business, industry, social agencies, or public health practice in governmental public health agencies and to describe the role of the preventive medicine physician in several subspecialties within public health practice. Rutherford, Seward

298. Group Study. (1-8) Staff

299. Independent Research. (1-12) W prefix=online course

Preparing and creating problem sets. Working with students one-on-one. Grading students’ writing and exams. Self-assessment. Developing a course syllabus. Using a variety of technology in public health classes. Required for first-time public health GSIs who are not participating in an SPH divisional pedagogy course. (F,SP) Staff

Public Policy
(Goldman School of Public Policy)
Office: 2607 Hearst Avenue, (510) 642-4670
Dean: John E. Brady, Ph.D.
Assistant Dean for Academic Affairs: Martha Chavez, M.S.
Professors
Henry E. Brady (Dean), Ph.D. M.I.T. Quantitative methodology, American and Canadian politics, political behavior.
Alain de Janvry, Ph.D. University of California, Berkeley. International rural economic development.
John W. Elwood, Ph.D. Johns Hopkins University. Policy process, public budgeting, international behavior.
Lee S. Friedman, Ph.D. Yale University. Applied microeconomics, public sector decision making.
W. Michael Hanemann, Ph.D. Harvard University. Environmental and resource economics, philosophy, politics, economics.
Daniel Kammen, Ph.D. Harvard University. Energy, society, technology.
David L. Kirp, LL.B. Harvard University. Law, politics, education, gender.
Robert J. MacCoun, Ph.D. Michigan State University. Social psychology, judgment and decision making, civil and criminal justice.
Michael Nachtm, Ph.D. Columbia University. U.S. national health policy, international health policy, public management.
Michael O’Hare, Ph.D. Harvard University. Management, urban studies, arts and cultural policy, environmental governance.
John M. Quigley, Ph.D. Harvard University. Microeconomics, public finance.
Steve Raphael, Ph.D. University of California, Berkeley. Urban and labor policy, economics of racial inequality.
Robert B. Reich, J.D. Yale University. Industrial policy, jobs and employment policy, leadership and social change, macroeconomic policy, social and economic policy.
Suzanne Scotchmir, Ph.D. University of California, Berkeley. Expenditure decisions in public finance, cost-benefit analysis, welfare economics.
Eugene Bardach (Emeritus), Ph.D. Benefit/cost analysis, welfare economics.
Robert Berkovitz (Emeritus), Ph.D. David Gardner (Emeritus), Ph.D.
Arnold J. Mettler (Emeritus), Ph.D.
Allan P. Sindler (Emeritus), Ph.D.
Eugene Smolensky (Emeritus), Ph.D.
Percy H. Tannenbaum (Emeritus), Ph.D.
Associate Professors
Jack Glaser, Ph.D. Yale University. Social and political psychology, prejudice and discrimination, hate crime.
Jane Mauidon, Ph.D. Princeton. Criminal justice, criminal policy, public health and economics, urban planning, demography.
Assistant Professors
Sean Faff, Ph.D. Columbia University. J.D. New York University. Law and public policy.
Rucker Johnson, Ph.D. University of Michigan, Ann Arbor. Social policy.

Associate Adjunct Professor
Stephen Maurer, J.D. Harvard University. Homeland security, innovation, database policy

Overview
The Goldman School of Public Policy (GSPP) is one of the nation’s premier graduate institutions for training the next generation of policy professionals. It enrolls the most promising contemporary policy professionals from around the world and throughout the world. GSPP is an eclectic community of students, faculty, staff and visitors, all committed to the highest standards of policy analysis, intellectual rigor, and energetic policy debate.

GSPP was one of the first institutions in the United States established for the analysis and development of public policy. For almost four decades, it has been a leader in the teaching of methods of policy analysis using microeconomic, statistical,
political, management, legal, and information technology skills to help solve real-world problems. GSPP is consciously multidisciplinary in its outlook and orientation. Its faculty is drawn from economics, political science, law, social psychology, demography, architecture, physics, and engineering. In addition, students can study with leading scholars in a variety of other disciplines and fields throughout the Berkeley campus.

Great emphasis is placed on team projects, sharpening oral and written communication skills, and creative thinking. Students have opportunities to work on policy problems for real clients and also to address scholarly and methodological issues in depth. The result is an exceptional learning experience, both inside and outside the classroom.

Our graduates have risen to leadership positions as policymakers, analysts, and managers at all levels of government, the nonprofit sector, private institutions, and international organizations.

Undergraduate Courses

The undergraduate courses in public policy deal with the substance of public policy, how it is made, how its effects can be gauged, and what the purposes of policy should be. The courses consider both the policy process and particular policy issues. By examining different policy problems in their political and social contexts, students gain a greater sensitivity to the forces that shape and carry out public policies and to the impact of social, political, economic, and legal power.

Courses are designed for students in diverse disciplines and professional schools. There are no prerequisites for enrollment in the undergraduate courses unless specifically noted otherwise in the course descriptions. The training provided by the courses is useful to those interested in combining the substantive perspectives of the social sciences with the more temporary problems: to those considering professional study; and to those considering graduate study and typically work closely with school faculty.

Undergraduate Minor in Public Policy

Faculty Chair, Undergraduate Minor in Public Policy: Michael O’Hare
Associate Director of Admissions and Student Affairs: Jaliah LaBrie

The undergraduate minor in public policy introduces students from other departments and colleges to the field and practice of policy analysis. The minor’s requirements are five courses in public policy, at least three of which must be upper division. All classes must be taken at GSPP or from the approved list of courses outside of the school. PP 101 is required of all students in the minor. Students must achieve at least a C average (2.0) in the five courses. When students complete the minor, the school notifies the Office of the Registrar. Completion of the minor will be noted on the students’ transcripts of Berkeley work.

Graduate Courses

Through an examination of domestic and international policy areas, graduate courses enable students to conduct systematic work in the design and assessment of public policies. Among the skills emphasized are those facilitating the application of political, organizational, economic, quantitative, and legal analysis to the full range of the policy process—from policy initiation through policy adoption, implementation, and evaluation. By developing these skills, students should find their strengthened analytical capabilities of direct use when applied to their own field of concentration.

Master in Public Policy

Assistant Dean for Academic Affairs: Martha Chavez
Associate Director of Admissions and Student Affairs: Jaliah LaBrie
Admissions and Student Affairs Adviser: Carla Vaccarezza

The M.P.P. degree is earned in a two-year, full-time program consisting of a core curriculum, a policy internship in the summer after completion of the first year, a second-year policy analysis project, and elective courses chosen from those available on the campus and at GSPP. The program emphasizes practical and applied dimensions of policy-making and implementation, encouraging students to develop skills in:

- defining policy issues to make them more intelligible to officials in the public, private, or nonprofit sector;
- providing a broader perspective for assessing policy alternatives;
- examining techniques for developing policy options and evaluating their social consequences; and
- developing strategies for the successful implementation of public policies once they have been adopted.

Given the relatively small class size, GSPP’s approach to teaching emphasizes teamwork, cooperation, and interaction among students and with the faculty. Students work, either as individuals or in small groups, on real policy problems for real clients under close faculty supervision.

Coordinated Degree Programs with Other Berkeley Colleges and Schools

The M.P.P. may be earned in combination with a policy-related degree from one of the following Berkeley colleges and schools under a coordinated program:

- M.P.P./J.D. with the UC Berkeley School of Law;
- M.P.P./M.P.H. in health policy and administration with the School of Public Health;
- M.P.P./M.A. in international and area studies with the College of Letters and Science; or
- M.P.P./M.S. with the College of Engineering.

Ph.D. in Public Policy

Faculty Chair, Ph.D. Program: John W. Ellwood, Ph.D.
Assistant Dean for Academic Affairs: Martha Chavez
Admissions and Student Affairs Adviser: Carla Vaccarezza

GSPP offers a doctoral degree program for students who seek careers in policy research with universities or research institutes. Usually only three or four Ph.D. applicants are admitted each year, including those admitted from the GSPP’s M.P.P. students. Non-GSPP applicants who seek a policy research career and have completed graduate work in public policy comparable to our M.P.P. may also be eligible for admission consideration.

The Ph.D. program emphasizes the generation of knowledge, theories, methodologies, and applications appropriate to the advancement of public policy analysis and management. Doctoral students pursue highly individualized programs of study and typically work closely with school faculty members who share the student’s subject matter interest.

Further Information

Brochures and information on admissions procedures and student financial assistance are available from the Goldman School of Public Policy, University of California, Berkeley, 2607 Hearst Avenue #7320, Berkeley, CA 94720-7320.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-3 to be graded on a letter-grade basis. Sections 4-6 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty mentor in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment limited to 15 freshmen. (F,SP)

98. Group Study in Public Policy. (1-4) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study on selected public policy topics. Open to freshmen and sophomores. (F,SP) Staff

Upper Division Courses

101. Introduction to Public Policy Analysis. (4) Three hours of lecture and one hour of discussion per week. A systematic and critical approach to evaluating and designing public policies. Combines theory and application to particular cases and problems. Diverse policy topics, including environmental, health, education, communications, safety, and arts policy issues, among others. (F,SP) Staff

103. Wealth and Poverty. (4) Two hours of lecture and two hours of discussion per week. This course is designed to provide students with a deeper understanding both of the structure of political economy and of why the distribution of earnings, wealth, and opportunity have been diverging in the United States and in other nations. It is also intended to provide insight into the political and public policy debates that have arisen in light of this divergence as well as possible means of reversing it. (SP) Reich

C103. Wealth and Poverty. (4) Students will receive no credit for C103 after taking 103. Two hours of lecture and two hours of discussion per week. This course is designed to provide students with a deeper understanding both of the organization of the political economy in the United States and of other advanced economies, and of why the distribution of earnings, wealth, and opportunity have been diverging in the United States and in other nations. It is also intended to provide insights into the political and public-policy debates that have arisen in light of this divergence, as well as possible means of reversing it. Also listed as Letters and Science C180U. (SP) Reich

117AC. Race, Ethnicity, and Public Policy. (4) Three hours of lecture per week. The objective of this course is to use the tools and insights of public policy analysis as a means of understanding the ways in which policies are shaped and to respond to issues of race, ethnicity, and cultural difference. The course is organized around a series of discrete policy problems involving issues of race and ethnicity. It is designed to allow for comparative analysis within and across cases to explore the ways in which policy intersects with different racial and ethnic groups. This course satisfies the American Cultures requirement. (SP)

C142. Applied Econometrics and Public Policy. (4) Three hours of lecture and zero to one hour of laboratory per week. Prerequisites: ECON 140 or 141 or consent of instructor. This course focuses on the sensible application of econometric methods to empirical problems in economics and public policy analysis. It provides background on issues that arise when analyzing non-experimental social science data and a guide for tools that are useful for empirical research. By the end of the course, students will have an understanding of the types of research designs that can lead to convincing analysis
156. Program and Policy Design. (4) Three hours of seminar per week. Studio/lab/oratory in the design of normative economic experiments. Complements core curricula in policy analysis, public management, economics, and political science; especially intended to integrate elements of professional programs in public policy and related areas. Students will design, in groups and individually, programs and policies that create value in the public sector, including statutes, regulations, and implementation projects. Comparative reviews will feature invited guests. Undergraduate level of 256. (SP) O’Hare

157. Arts and Cultural Policy. (4) Three hours of lecture per week. Formerly 108. Survey of government policy toward the arts (especially direct subsidy, copyright and regulation, and indirect assistance) and its effects on artists, audiences, and institutions. Emphasizes “highbrow” arts, U.S. policy, and the social and economic roles of participants in the arts. Readings, field trips, and case discussion. One paper in two drafts required for undergraduate credit; graduate credit awarded for an additional short paper to be arranged and attendance at four advanced colloquia throughout the term. Undergraduate level of 257. (F) Friedman

164. Impact of Government Policies on Poor Children and Families. (4) This course may be applied to the demography major. Three hours of lecture per week. Formerly 164. Examination of the impact of policies of state intervention and public benefit programs on the social, economic, and political well-being of poor children and the family, and study of specific issue areas, such as income transfer programs, housing, health care, and child abuse. Also listed as Demography 54, 54. (F) Maureen O’Hare

179. Public Budgeting. (4) Three hours of lecture per week. Public sector budgeting incorporates many, perhaps most, of the skills of the public manager and analyst. The goal of this course is to develop and hone these skills. Using cases and readings from all levels of American government, the course will allow the student to gain and understanding of the effects and consequences of public sector budgeting, its processes, and the potential impacts of various reforms. Undergraduate level of Public Policy 269. This course can be applied to the political science major. (SP) Ellwood

182. Environment and Technology from the Policy and Business Perspective. (4) Three hours of lecture and one hour of discussion per week. Major and minor level. The course presents environmental policy and management issues and illustrates the complex issues of policy making with diverse interest groups. The class includes case studies, guest practitioners, and a group project in which students employ a range of analytic tools and frameworks in order to develop creative, effective, and actionable environmental solutions. (F,SP) Taylor

189. Special Topics in Public Policy. (1-4) Course may be repeated for credit with consent of instructor. One to four hours of lecture per week depending on the topic. Prerequisites: Academy, issues and problems in the field of public policy. Topics may vary from year to year and will be announced at the beginning of the semester. Open to students from other departments. (F,SP)

198. Directed Group Study. (1-4) Course may be repeated for credit. Must be taken on a pass/fail basis. Prerequisites: Consent of instructor. Group study of a selected topic or topics in public policy. Meetings to be arranged.

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Must be taken on a pass/fail basis. Prerequisites: Upper division standing. For upper division students wishing to pursue special study and directed research under direction of a member of the staff. Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog. (F,SP)

200. Introduction to Policy Analysis. (4) Four hours of discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy. This introductory course provides students with an introduction to social science disciplines and applies these perspectives to problems of public policy. Throughout the academic term, students will apply knowledge of politics, economics, sociology, and quantitative methods in the analysis of cases. Emphasis will be placed on decision-making processes. Students learn to use the techniques of social science to evaluate projects and programs. Course will include the preparation of a major paper for a client. (SP)

205. Advanced Policy Analysis. (6) Three hours of seminar per week. Prerequisites: Open only to majors who have completed the core curriculum. Each student will conduct thorough analysis on a major policy question. In this seminar, students will apply interdisciplinary methods, approaches, and perspectives studied in the core curriculum. (SP)

210A-210B. The Economics of Public Policy Analysis. (4;4) Three hours of lecture/discussion and one hour of session per week. Prerequisites: Open only to students in the Graduate School of Public Policy. This course focuses on the economic elements of public policy and related areas. Students will design, in groups and individually, programs and policies that create value in the public sector, including statutes, regulations, and implementation projects. Comparative reviews will feature invited guests. Graduate level of 156. (SP) O’Hare

210A-210B. The Economics of Public Policy Analysis. (4;4) Three hours of lecture/discussion and one hour of session per week. Prerequisites: Open only to students in the Graduate School of Public Policy. Topics of microeconomic behavior of consumers, producers, and bureaucrats are developed and applied to specific policy areas. Ability to analyze the effects of government policy on economic efficiency is encouraged. Emphasis on resource allocation and (2) equity is stressed. Policy areas are selected to show a broad range of actual applications of theory and a variety of policy strategies. (F,SP)

220. Law and Public Policy. (4) Four hours of lecture/ discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy. This course discusses and criticizes the conceptual foundations of cost-benefit analysis, and analyzes in depth some important applied aspects such as endogenous prices of other commodities, methods to infer willingness to pay, valuation of life, uncertainty and the rate of discount. (F)

226. Public Leadership and Management. (4) Four hours of lecture/discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy and a select few students at other graduate schools. Formerly Public Policy 230B. This course is designed to help students develop their skills for leading and managing groups, government agencies, nonprofit organizations, and public advocacy, with the emphasis being on deciding what to do, how to go about doing it, and how to decide. Materials include case studies, analyses, and works from several disciplines. Course is open to first- and second-year MPP students, but recommended for first year. (SP) O’Hare

250. Political and Agency Management Aspects of Public Policy. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy. Formerly 230A. This course examines the political and organizational factors involved in developing new policies, choosing among alternatives, gaining accep- tance, and ensuring implementation, and coping with unan- ticipated consequences. Materials will include case studies, theoretical, empirical, and interpretive works from several disciplines. (F) Ellwood

Graduate Courses

251. Microeconomic Organization and Policy Analysis. (3) Two hours of seminar and one hour of classroom per week. Prerequisites: Administration 101B or Economics 204A or equivalent, and consent of instructor. Seminar to develop policy analyses based on microeconomic theorems of choice and cumulative comparative dynamics and behavioral theory of regulatory agencies and bureaucracies, and productivity in the public sector. (F) Friedman

C253. International Economic Development Policy. (3) Three hours of lecture per week. Prerequisites: Minimum one semester of graduate-level microeconomics and statistics or consent of instructor. This course emphasizes the development and application of policy solutions to developing-world problems focusing on poverty, income, and environmental sustainability. Methods of statistical, economic, and policy analysis are applied to a series of case studies. The course is designed to develop practical policy skills for application in the international arena. Also listed as Economics and Resource Economics C253. (F)

256. Program and Policy Design. (4) Three hours of seminar per week. Formerly 206. Studio/lab/oratory in the design of non-physical environments. Complements core curricula in policy analysis, public management, economics, and political science; especially intended to integrate elements of professional programs in public policy and related areas. Students will design, in groups and individually, programs and policies that create value in the public sector, including statutes, regulations, and implementation projects. Comparative reviews will feature invited guests. Graduate level of 156. (SP) O’Hare

257. Arts and Cultural Policy. (4) Three hours of lecture per week. Formerly 208. Survey of government policy toward the arts (especially direct subsidy, copyright and regulation, and indirect assistance) and its effects on artists, audiences, and institutions. Emphasizes “highbrow” arts, U.S. policy, and the social and economic roles of participants in the arts. Readings, field trips, and case discussion. One paper in two drafts required for undergraduate credit; graduate credit awarded for an additional short paper to be arranged and attendance at four advanced colloquia throughout the term. Graduate level of 157. (F) O’Hare

259. Cost-Benefit Analysis. (3) Three hours of sem- inar per week. Prerequisites: Calculus and interme- diate microeconomics or consent of instructor. This course discusses and criticizes the conceptual foun- dations of cost-benefit analysis, and analyzes in depth some important applied aspects such as endogenous prices of other commodities, methods to infer willingness to pay, valuation of life, uncertainty and the rate of discount. (F)

260. Public Leadership and Management. (4) Four hours of lecture/discussion per week. Prerequisites: Open only to students in the Graduate School of Public Policy and a select few students at other graduate schools. Formerly Public Policy 230B. This course is designed to help students develop their skills for leading and managing groups, government agencies, nonprofit organizations, and public advocacy, with the emphasis being on deciding what to do, how to go about doing it, and how to decide. Materials include case studies, analyses, and works from several disciplines. Course is open to first- and second-year MPP students, but recommended for first year. (SP) O’Hare

268. Wealth and Poverty. (4) Three hours of lecture per week. Prerequisites: Graduate student or consent of instructor. This course is designed to provide students with a deeper understanding of why the distri- bution of income and wealth has been diverging in
the United States and other nations. It is also intended to provide insight into the political and policy debates that have arisen in light of that divergence, and to give students ways to understand both the limits and possibilities of political and policy responses to it. The approach is interdisciplinary, drawing mainly upon research and concepts from economics, political science, and sociology. (SP) Reich

269. Public Budgeting. (4) Three hours of lecture-discussion per week. This course studies the role of public sector budgeting in public policy making and the effects of budgeting on the output of public sector agencies. (F) S. Reich

270. Kid-First Policy: Family, School, and Community. (4) Three hours of lecture per week. This seminar examines the critical policy choices that shape the lives of children and adolescents from birth through high school and beyond. The issues are varied—and hotly debated by politicians and policymakers—as banning coke machines in schools to reduce obesity, regulating child labor, providing universal preschool and helping abused children. Students from across the campus—public policy, education, social welfare, business, sociology, political science, economics—contribute to the debates. Discussions and readings draw on insights from across the policy sciences. Problem-solving is the focus in seminar meetings and research projects. (F,SP) Kip

C275. Housing and the Urban Economy. (3) Three hours of seminar per week. Prerequisites: 210A-210B or equivalent. This course considers the economics of urban housing and land markets from the viewpoints of investors, developers, public and private managers, and consumers. It considers the interactions between public and private regulation—such as land use policy, taxation, and government subsidy programs. We will also analyze the links between primary and secondary mortgage markets, securitization, and liquidity. Finally, the links between local housing and related markets—such as transport and public finance—will be explored. Also listed as City and Regional Planning C224. (F) Quigley

279. Research Design and Data Collection for Public Policy. (3-6) Three hours of lectures and three hours of seminar per week. Prerequisites: At least one semester of statistics. Public policy analysis requires a sophisticated understanding of a variety of data. Emphasis is placed on the concepts and methodologies that researchers use to plan, execute, and evaluate research. The course teaches you how to analyze data; this course will introduce you to strategies of data collection and principles for critically evaluating data collected by others. Topics include measurement reliability and validity, questionnaire design, sampling, experimental and quasi-experimental program evaluation designs, qualitative research methods, and the politics of data in public policy. (SP) C291

280. Ethics, Policy, and the Power of Ideas. (4) Three hours of seminar per week. This seminar brings together two related frames for policy thinking: (1) the ethics of policy (that is, what does it mean to do the right thing?) and (2) the intervention of policy (that is, how do new policy paradigms emerge?). Ethics: Those who seek to govern well inescapably confront questions of value in their political, professional, and personal choices. The course studies of ethical dilemmas which will be the focus of the seminar, is designed to provoke analytic reflection on the moral challenges and responsibilities of public policy-making in a democracy. The focus is on the many and often competing ethical principles, ideas, and values that should guide public actors, as well as on the public principles that guide the design of good public policy. Big Ideas: Politics and conventional analytics dominate policy analysis and decision making, yet over the long term, conceptualizations as varied as exit/voice/loyalty, satisficing, the tipping point, memes, winner-take-all, strong democracy, broken windows, and the prisoners dilemma profoundly influence the policy consensus. (F.SP) Kirp

282. Environment and Technology from the Policy and Business Perspective. (4) Three hours of lecture and one hour of discussion per week. Most environmental issues involve technology, either in the role of “villain” or “hero.” This course uses the lens of specific technologies, including environmental policy and management, with an emphasis on the complexities of policy-making with diverse interest groups. The class includes case studies, guest practitioners, and a group project in which students employ a range of analytic tools and frameworks in order to develop creative, effective, and actionable environmental solutions. (F,SP) Taylor

C284. Energy and Society. (4) Three hours of lecture and one hour of discussion per week. Energy sources, uses, and impacts; an introduction to the technology, politics, economics, and environmental effects of energy in contemporary society. Energy and well-being; energy international perspective, origins, and character of energy crisis. Also listed as Energy and Resources Group C200. (F,SP) Kamen

286. U.S. National Security Policy. (4) Three hours of lecture per week. An intensive examination of the concepts, organizations, issues, and policies that shape U.S. national security policy. Special topics include defense policy, with a focus on deterrence and containment, alliance cohesion and power projection, crisis management, nuclear weapons, and strategies for military intervention. Second half focuses on global war on terrorism, homeland security, nuclear weapons proliferation, and U.S.-China strategic relations. Course requires extensive student participation, policy memos, and an examination. (F,SP) Nachter

288. Risk and Optimization Models for Policy. (4) Four hours of lecture per week. Prerequisites: One course in statistics/probability. Optimization and simulation models in stochastic and deterministic contexts. Monte Carlo simulation, Bayesian models and decision analysis, linear and nonlinear programming, queuing models, and a review of heuristics and biases in individual risk assessment. Hands-on exploration of tools oriented to management and policy decisions in public and nonprofit organizations. Objective for students: life-long habit of learning and using new analytic methods. (F) O’Hare

290. Special Topics in Public Policy. (1-4) Course may be repeated for credit. One to four hours of lecture per week. Topics vary from year to year and are announced at the beginning of the semester. Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: For candidates for Ph.D. Individual study in consultation with the major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. May not be used for unit or residence requirements for the doctoral degree. (F,SP)

Professional Courses

300. GIS Practicum. (2) Two hours of lecture per week. This course is directed at graduate students in public policy analysis, and reviews the most important elements of effective teaching, especially teaching graduate students in professional programs like the Master of Public Policy. It satisfies the Graduate Division requirement for a 300 course for GSIs. (F,SP) O’Hare

Range Management
(Degree of Natural Resources Interdepartmental Graduate Groups)

Office: 133 Multi-Bldg. Hall, 610-642-6410 epgm.berkeley.edu/gradprograms/grad programs_msar.php
Chair: James Bartolome, Ph.D.

Professors
Barbara H. Allen-Diaz, Ph.D. Rangeland ecology and management (Environmental Science, Policy, and Management)
Reginald H. Barrett, Ph.D. Wildlife biology and management (Environmental Science, Policy, and Management)
James W. Bartolome, Ph.D. Rangeland ecology and management (Environmental Science, Policy, and Management)
John Lyles, Ph.D. Forest community ecology (Environmental Science, Policy, and Management)
Steven H. Bissinger, Ph.D. Conservation biology (Environmental Science, Policy, and Management)
William E. Dietrich, Ph.D. Hillslope and fluvial geomorphology (Earth and Planetary Science)
Mary K. Firestone, Ph.D. Soil microbiology, nutrient cycling (Environmental Science, Policy, and Management)
Pamela J. Hafner, Ph.D. Rangeland vegetation science (Environmental Science, Policy, and Management)
Louise P. Fortmann, Ph.D. Natural resource sociology (Environmental Science, Policy, and Management)
Lynn Huntsinger, Ph.D. Rangeland ecology and conservation (Environmental Science, Policy, and Management)

Graduate Electives
Joe R. McBride, Ph.D. Forest ecology (Environmental Science, Policy, and Management)
Jeffrey M. Romm, Ph.D. Natural resource and environmental policy (Environmental Science, Policy, and Management)
Harold F. Seidman (Environmental Science, Policy, and Management Emeritus), Ph.D.
John J. Clemens (Environmental Science, Policy, and Management Emeritus), Ph.D.
William J. Lidicker (Environmental Science, Policy, and Management Emeritus), Ph.D.
Dale R. McCullough (Environmental Science, Policy, and Management Emeritus), Ph.D.
Theresa E. Rowe (Environmental Science, Policy, and Management Emeritus), Ph.D.

Interdepartmental Graduate Groups

Environmental Science, Policy, and Management

John D. Radke, Ph.D. Geography, geographical information systems in landscape analysis and environmental planning (Landscape Architecture and Environmental Planning)
Nathan Sayre, Ph.D. Geography of Rangelands (Geography)

Assistant Professor
Jeffrey T. McDonald, Ph.D. Wildlife Conservation (Environmental Science, Policy, and Management)
Religious Studies

( brawl of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 231 Evans Hall, (510) 642-2363
ugis.la.berkeley.edu/religiousstudies

Director of the Major
Advisory Committee
Richard B. Standiford, Ph.D. Wildland economics and management
Adina M. Merenlender, Ph.D. Ecology, conservation biology, landscape ecology using GIS (Environmental Science, Policy, and Management)
Marty Gaetjens, Niek Veldhuis (Near Eastern Studies)
Robert Sharf, Carol Redmount (Near Eastern Studies) (Anthropology)
Margaret Larkin, Niklaus Largier, Geoffrey Koziol (Near Eastern Studies)
David Hollinger (History)
Charles Hirschkind, John Efron (Near Eastern Studies) (South and Southeast Asian Studies) (History)
Vasudha Dalmia (Near Eastern Studies)

Director: Steve Justice
Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 231 Evans Hall, (510) 642-2363
ugis.la.berkeley.edu/religiousstudies

Graduate Adviser: Ms. Allen-Diaz

Program Overview
The Graduate Program in Range Management is administered by a multidisciplinary group of faculty members from the Department of Environmental Science, Policy, and Management and related departments at Berkeley. The program prepares students to enter into a new career with a bachelor’s degree in resource management or related disciplines to pursue advanced work. Graduate study leads to a Master of Science degree that serves as the basis for a professional career in rangeland management. Fields of specialization include grassland, savanna, and shrubland ecology; rangeland reclamation; wetland ecology; and rangeland policy.

Excellent laboratory and field facilities are available for student research. These include several experimental range properties and large wildlife ranges easily accessible from Berkeley. The faculty is actively engaged in both theoretical and practical research.

Doctoral work in range management may be pursued as part of the Ph.D. program in environmental science, policy, and management.

Religious Studies

( College of Letters and Science)

Group Major Office: Division of Undergraduate and Interdisciplinary Studies, 231 Evans Hall, (510) 642-2363
ugis.la.berkeley.edu/religiousstudies

Director of the Major
Advisory Committee
Daniel Boyarin (Near Eastern Studies)
Yasuha Dalma (South and Southeast Asian Studies)
Thomas Dantel (History)
John Efron (History)
Suanna Elm (History) Mariane Freme (Anthropology)
Robert Goldman (South and Southeast Asian Studies)
Donald Hendel (Near Eastern Studies)
Charles Hirschkind (Anthropology)
David Hollinger (History)
Steven Justice, Director, (English)
Gerard W. Meier (Near Eastern Studies)
Niklaus Largier (German)
Margaret Larkin (Near Eastern Studies)
Saba Mahood (Anthropology)
Carol Redmount (Near Eastern Studies)
Alexander V. Rossetti (South and Southeast Asian Studies)
Robert Shafl (Near Eastern Studies)
David Stronach (Near Eastern Studies)
Niek Veldhuis (Near Eastern Studies)
Duncan Williams (East Asian Languages and Cultures)

Student Affairs Officer: Marty Gaetjens, Undergraduate and Interdisciplinary Studies, 283 Evans Hall, (510) 642-2363

Group Major in Religious Studies

The religious studies major provides opportunities for securing a broad background in the liberal arts while at the same time allowing for a focus on a thematic area or a particular religious tradition. It views religion from a global perspective and combines aspects of the humanities and the social sciences.

The major is open to anyone interested in the study of religion as it relates to the development of civilizations, the ethical aspects of human societies, and existential issues. It is not restricted to those who have a religious background or are pursuing a religious voca-

tion. Members of the major will be challenged to view religion multiculturally and from critical as well as appreciative perspectives.

Graduates in the program have gone on to careers in law, journalism, medicine, international business, counseling, and religious vocations. Others have entered graduate schools in history, sociology, anthropology, international policy, and religious studies.

The program requires both a general understanding of the study of religion as well as a particular emphasis on one specific tradition or thematic concern. The general requirement involves courses that present the methodological approaches to the study of religion, such as sociology of religion and psychology of religion. The courses examine thematic issues and cross-cultural phenomena, such as myth, ritual, transformative experience, and comparative ethics. The religious traditions that may be included as major fields of emphasis or as supplementary courses include the Jewish, Islamic, Christian, Hindu, and Buddhist traditions, as well as the religious cultures of China, Japan, Africa, and Native American communities.

Most of the courses available for the program are religion-related courses taught within such depart-

ments as history, sociology, and Near Eastern studies. As a supplement to these courses, the program requires for all majors several courses sponsored by religious studies, including thematic topics of religion and the introductory courses (one of which surveys the world’s religious traditions, and the other of which introduces the study of religious phenomena thematically).

The Group Major in Religious Studies is adminis-
tered through the Division of Undergraduate and Interdisciplinary Studies. Students are referred to that office for all administrative matters.

Lower Division Requirements:
Religious Studies 90A-90B, Introductory Topics in Religious Studies (4,4), to be taken before selecting a field of emphasis.

Upper Division Requirements:
Two methodological courses from the following: Anthropology 158 (Religion and Anthropology); Geography 107 (Geography of Religions); Sociology 112 (Sociology of Religion); Religious Studies 190 (Topics in the Study of Religion), when topic is methodological.

Two thematic courses from the following: Classics 176 (Mythology) or Comparative Literature 165 (Myth and Literature); Religious Studies 115 (Mythism) or Comparative Literature 125 (The Mystical Tradition in Literature); Religious Studies 190 (Topics in the Study of Religion), when topic is thematic.

Three courses in one of the fields of emphasis (see below).

Additional religion courses to make a total of at least 30 upper division units. The selection of these courses in consultation with a religious studies adviser (see below).

Fields of Emphasis. The field may be any cross-cultural theme (such as the study of ritual, myth, or ethics) in which courses are available, a cultural period (such as the religious interaction of medieval Europe or modern Asia), or the study of a single religious tradition (such as Christianity or Judaism). Students are required to take a course available in religious traditions include the following:

Buddhism: East Asian Languages (Chinese) 120, 122, 130. Additional courses: East Asian Languages (Chinese) 140, South Asian 127, 140. Recommended: Students intending to do graduate work in Buddhism should study Tibetan, Chinese, Sanskrit, Tamil, or Hindi.

Christianity: Religious Studies 120A or History 108; Religious Studies 120B or History 156A; History 158A or 156A; Religious Studies 115. Additional courses: Classics (Greek) 105; English 107, 110A-110B; History 108; Italian 109A-109B, 130; Religious Studies 110B; Philosophy 182, 184; Religious Studies 190, when topic is Christian. Recommended: Students intending to do graduate work in Christianity should study Latin, Greek, or German.

Major Program. Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their major.

Honors Program. Students may elect to attempt graduate work in the major and be considered for admission to the Honors Program. To be eligible for consideration for admission to the Honors Program, students must present evidence of superior intellectual potential, the ability to work in a small-seminar setting, and a minimum overall GPA of 3.50.

Minor Program. Students in the College of Letters and Science may complete one or more minors of their choice, normally in a field both academically and administratively distinct from their major.

Honors Program. Students may elect to attempt graduate work in the major and be considered for admission to the Honors Program. To be eligible for consideration for admission to the Honors Program, students must present evidence of superior intellectual potential, the ability to work in a small-seminar setting, and a minimum overall GPA of 3.50.

Courses at the beginning of their senior year. Required are upper division work in a language relevant to the student’s work in the group major office and work out a plan of study with an adviser.

Students must take Religious Studies 90A and 90B and five upper division courses chosen from an approved list of courses available for the program (with consent of adviser) and the submission of a bachel-

or’s thesis as a culmination of one or two semesters of the sequence, Religious Studies H195A-H195B. The thesis must be approved by both the adviser and the student’s thesis director, if these are different.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportu-

nity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman semi-

nars are offered in all campus departments and topics vary from department to department and semes-

ter to semester. Enrollment limited to 15 freshmen. (F.S.P) Staff

90A-90B. Introductory Topics in Religious Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Selected introductory topics in the study of religion. (F.S.P) Staff

C90B. Introductory Topics in Religious Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Selected introductory topics in the study of religion. Also listed as South and Southeast Asian Studies C51. (SP) Dalmia

Upper Division Courses

C103. Religion of Ancient Egypt. (3) Three hours of lecture per week. Prerequisites: 18 or consent of instructor. A survey of the religious beliefs of the ancient Egyptians, based primarily upon the written sources. Also listed as Near Eastern Studies C103.
C104. Babylonian Religion. (3) Three hours of lecture per week. A survey of Babylonian religious beliefs and practices based on indigenous texts and manuscripts. Also listed as Near Eastern Studies C104.

C108. Scandinavian Myth and Religion. (4) Three hours of lecture per week. Religious belief and practice during the Viking Age in Scandinavia and their manifestations in later recordings. Reading and discussion in English. Also listed as Scandinavian C160. (F,SP) Staff

C109. Celtic Mythology and Oral Tradition. (4) Three hours of lecture per week. The course will introduce students to the pre-Christian beliefs of the Celtic and Indo-European worlds, the historical narratives in which such beliefs are embedded, and the methodology of investigating ancient and medieval belief systems. Also listed as Celtic Studies C168. Staff

C118. Western Mysticism: Religion, Art, and Literature. (4) Three hours of lecture and one hour of discussion per week. The course will focus on examples of mystical thought on the Christian and Jewish mystical theologies of the Middle Ages. In addition to the introduction of the students to basic texts and concepts, we will discuss the effects of mystical thought on the visual arts and the written word on the Middle Ages to today. Also listed as German C113. (F,SP) Larger

C119. The English Bible as Literature. (4) Three hours of lecture per week. Formerly 119. Introduction to the English Bible treated as a literary work. Also listed as English C107.

120A. Origins of Christianity. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 90A or 90B. History 4 or consent of instructor. The early Jesus movement in its social and historical setting. Particular attention to the transformations of various Jewish religious concepts; traditions about Jesus; the development of religious eschatology; Paul and his interpreters. Elms

C124. The Renaissance and the Reformation. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 90A or 90B or consent of instructor. The nature of classical Judaism, its major cultural and intellectual expressions in the Middle Ages, and transformations in the modern era. Staff

C132. Jewish Civilization I: The Biblical Period. (4) Three hours of lecture and one hour of discussion per week. This is the first course in a four-course sequence in the history of Jewish culture and civilization. It covers the biblical period and the period up to the destruction of the second temple. This course will explore the current state of our knowledge, including the legacy of ancient Near Eastern myth and religion, the history of Israelite literature, the literary features of biblical narrative, and the Dead Sea Scrolls. Also listed as Near Eastern Studies C135 and Undergraduate Interdisciplinary Studies C153.

C133. Judaism in Late Antiquity. (4) Three hours of lecture and one hour of discussion per week. This class will examine the emergence and development of classical Judaism, its piety, institutions, thought, and literature. Also listed as Near Eastern Studies C133 and Undergraduate Interdisciplinary Studies C153.

C135. Jewish Civilization: Modern Period. (4) Three hours of lecture and one hour of discussion per week. This is the fourth course in a four-course sequence in the history of Jewish culture and civilization. It explores the development of Jewish history from the 18th century to the present, with special attention paid to the transformation of Jewish communal and individual identity in the modern world. Topics include the breakdown of traditional religious and ethnic boundaries; the development of an assimilating assimilation; Hasidism, racial anti-Semitism, colonialism, Zionism, and contemporary Jewish life in Europe, North America, and Israel. The multicultural nature of Jewish history will be highlighted throughout the course through the treatment of non-European Jewish narratives alongside the more familiar Ashkenazi perspective. Also listed as History C175B and Undergraduate Interdisciplinary Studies C155. Staff.

C161. Religion in Early India. (4) Three hours of lectures and one hour of discussion per week. These courses are an introduction to the religions that have their origin on the Indian subcontinent—Hinduism, Buddhism, Jainism, Sikhism, and tribal religions—along with the religions that originated in other regions such as Islam, Christianity, Judaism, and Zoroastrianism. Organizing this material chronologically rather than teaching it by separate religious traditions facilitates comparisons and promotes understanding, not only of the differences among these religions but also some of their commonalities in philosophy, theo­r­y, and praxis. Also listed as South Asian C127. (F,SP) Staff.

C162. Religion in South India. (3) Three hours of lecture per week. Formerly 162. The development and practice of religion in South India. Emphasis will be on sources translated directly from Indian languages. Subjects covered include the indigenous religion, the effect of Brahmanical religion, bhakti movements, and the practice of Hinduism in modern South India. Also listed as South Asian C141. G. Hart

C163. Religious Movements in Modern India. (4) Three hours of lecture and one hour of discussion per week. Formerly 163. Introduces history of religious movements in modern India. Examines the dissemination and reinterpretation of sacred texts and religious ceremonies in India in a modern religious experience and religious authority at mid-century in an influential modern novel. Examines religious conver­sions, transformations of women’s roles, and the concept of a secular state in post-independence India. Shapes religious policy and practice. Also listed as South Asian C128. Staff

C164. Religion in Medieval India. (4) Three hours of lecture and one hour of discussion per week. This course is designed to provide a chronological and thematical approach to the study of religion in medieval India. It will cover the period from 600 to 1600 A.D.—a time of significant developments in both Hinduism and Islam on the subcontinent. Besides witnessing tremendous religious ferment in the South and the emergence of popular devotional movements within Hinduism in the North, the period also observed new mystical and regional articulations of Islam. Also listed as South Asian C123. (F,SP) Dalma, Faruqui

C165. Hindu Mythology. (4) Three hours of lecture per week. Formerly 165. Or consent of instructor. The course entails substantial selected readings from the great Sanskrit epic poems—the Mahabharata and the Ramayana in translation, selected excerpts of secondary literature on Indian epic studies as well as lectures on salient issues in both. Discussion will focus on a variety of historical and theoretical approaches to the study of the poems and their influence on the development of the Indian culture. Readings will be supplemented with selected showings of popular cinematic and television versions of the epics. Also listed as South Asian C140. (F,SP) Goldman

C166. India’s Great Epics: The Mahabharata and the Ramayana. (4) Three hours of lecture per week. Prerequisites: South Asian 5A, 127, 140, or consent of instructor. The course entails substantial selected readings from the great Sanskrit epic poems—the Mahabharata and the Ramayana in translation, selected excerpts of secondary literature on Indian epic studies as well as lectures on salient issues in both. Discussion will focus on a variety of historical and theoretical approaches to the study of the poems and their influence on the development of the Indian culture. Readings will be supplemented with selected showings of popular cinematic and television versions of the epics. Also listed as South Asian C142. Goldman

C171AC. Religious Pluralism in America. (4) Three hours of lecture and one hour of discussion per week. This course examines the diversity of American religious traditions as seen through the experience of some of its major racial, ethnic, and immigrant communities. Since ethnicity and issues of race play a defining role in the development of these religious communities, the theoretical focus of this course will center on the tensions racial and cultural differences created; the ways these communities resisted assimilation and transformed their cultural alienation; and the means they used to ease such tensions. Special attention will be given to how these communities sought to preserve traditional beliefs and practices in the face of trends toward accommodation as well as how these communities resisted assimilation and transformed their communities and their circumstances. Theoretically, then, this four-part social-cultural resis­tance/adaptation model—isolation/accommodation/conflict/transformation—will frame the course lecture and discussion materials. This course satisfies the American Cultures requirement.

C182. Sociology of Religion. (4) Three hours of lecture and two hours of discussion per week. The course will introduce students to the place of religious consciousness in human action and then survey comparatively and historically the role that religion has played in human society. Will include a general theory of the nature of religious consciousness, the variety of religious institutions, and the basis of religious community. Also listed as Sociology C112. (F,SP)

190. Topics in the Study of Religion. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Selected topics or problems in the study of religion. (F,SP) Staff

H195A-H195B. Honors Course. (3,3) Independent study. Course may take one or two semesters at the option of the instructor and student with credit to be earned upon completion of a successful thesis. Success in the independent study course will normally, but not necessarily, mean the awarding of honors. Staff

198. Directed Group Study. (1-4) Course may be repeated for credit. Independent study. Must be taken on a passed/not passed basis. Tutorial instruction in areas not covered by regularly scheduled courses. Staff

199. Supervised Independent Study. (1-4) Course may be repeated for credit. Independent study. Must be taken on a passed/not passed basis. (F,SP) Staff

Rhetoric
(College of Letters and Science)

Department Office: 7408 Dwinelle Hall, (510) 642-1415
rhetoric.berkeley.edu
Chair: David Cohen, Ph.D.
Professors
Daniel Boyarin, Ph.D. Jewish Theological Seminary of America. Talmud, Judaism and Christianity in Late Antiquity, religion and systems of sex and gender, rhetoric of interpretation. berkeley.edu
Judith Butler, Ph.D. Yale University. Feminist theory, sexuality studies, 19th- and 20th-century continental philosophy, philosophy and literature, social and political thought. berkeley.edu
Anthony J. Cescandi, Ph.D. Harvard University. Philosophy of literature, aesthetics, philosophy of technology, Renaissance/Early Modern
Pheng Cheah, Ph.D. Cornell University, 20th century continental philosophy and critical theory, postcolonial theory and anthropological relativism, theory of globalization, social and political thought, feminist theory. berkeley.edu
David Cohen, Ph.D. Cambridge University. J.D. University of California. Social theory, legal and social history, legal philosophy, classical rhetoric, international law, human rights
Marianne Constable, J.D., Ph.D. University of California. Legal rhetoric and philosophy, theories of interpretation, social and political thought; Anglo-American legal traditions; contemporary law and society.
Shannon Jackson, Ph.D. Northwestern University. Performance studies; history and theory of theatre and experimental performance; the study and practice of oral performance, adaptation, and oral narrative.
Mishra T. Tirth, Ph.D. University of Illinois. Postcolonial theory, film theory and aesthetics, Avant-Garde cinema, documentary, feminist theory.
Hendrik S. Sins, Ph.D. University of California, Denver. History and genre, melodrama and pornography, feminist theory, visual culture
Seymour B. Chatman (Emeritus), Ph.D.
Carol Clover (Emeritus), Ph.D.
D. Bridget Connolly (Emeritus), Ph.D.
D. Dole (Emeritus), Ph.D.
Barbara Shapiro (Emeritus), Ph.D.
K. S. Silverman (Emeritus), Ph.D.
N. S. Smith (Emeritus), Ph.D.
Todd G. Willy (Emeritus), Ph.D.

Associate Professors
David Banes, Ph.D. University of Chicago. Modern European intellectual history, history of political and legal thought, history of cognition, philosophy of history
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Michael Mascuch, Ph.D. Cambridge University. Cultural and social history, 1500-1600; the history and theory of orality and literacy; the history and theory of historiography, autobiography, narrative discourse, the novel; social and cultural history of the imagination.

Daniel F. Melia, Ph.D. Harvard University. Oral literature, Celtic languages (Welsh, Irish), folklore, medieval history and literature.

Ramona Naddaff, Ph.D. Boston University. Ancient Greek philosophy; the history of philosophy; contemporary French thought, aesthetics.

Hubert Dreyfus, Ph.D. Harvard University. Phenomenology, existentialism, philosophy of science, philosophy of literature, philosophical implications of artificial intelligence.

Anthony Long (The Irving Stone Professor of Philosophy), Ph.D. University of London. Ancient philosophy and Greek literature.

Hans Sluga, B. Phil. Oxford University. Twentieth-century philosophy of language and analytical philosophy.

Anton Kaes, Ph.D. Stanford University. Film theory, German intellectual history, Marxist theory, visual discourse and culture.

Anton Kaes, Ph.D. Stanford University. Film theory, German intellectual history, Marxist theory, visual discourse and culture.

Affiliated Faculty

Felipe Gutterriez, J.D., Ph.D. University of California, Lecturers.

Anthony Long, Victoria Kahn, Ph.D. Yale University. Renaissance literature, rhetorical theory, history of rhetoric.

Martin Jay, Ph.D. Harvard University. European intellectual history, Marxist theory, visual discourse and culture.

Hubert Dreyfus, Ph.D. Harvard University. Phenomenology, existentialism, philosophy of science, philosophy of literature, philosophical implications of artificial intelligence.

Michael Mascuch, Ph.D. Cambridge University. Cultural and social history, 1500-1600; the history and theory of orality and literacy; the history and theory of historiography, autobiography, narrative discourse, the novel; social and cultural history of the imagination.

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Department Overview

Rhetoric majors are trained in the history of rhetorical theory and practice, grounded in argumentation and the analysis of the symbolic and institutional dimensions of discourse. The department offers both a pragmatic understanding of the elements of rhetorical analysis—with special attention to logic, style, tropes, figures, images—and a thorough grounding in theoretical and critical approaches to these elements in rhetorical theory. The combination allows students to make a disciplined grasp of the contemporary character of rhetoric and language. Through its emphasis on the history and theory of rhetoric, the department provides an understanding of the format of contemporary theories of interpretation as well as an opportunity, within this framework, to explore the role of persuasion in pragmatic and aesthetic contexts.

Note: The major is not intended to provide skills-based training in oral argument or communication.

Major Program

Undergraduates may concentrate in one of the following areas: (1) history and theory of rhetoric, (2) public discourse, and (3) narrative and image.

Majors must complete the following course requirements: Philosophy of law; continental philosophy; the history of philosophy; modern and contemporary social, moral, legal, and political thought.

Rhetoric 103A and 103B should be completed in sequence during the junior year; seniors may be recommended to continue work in the specified area of concentration. However, concurrent enrollment in 103A and 103B and other upper division courses in rhetoric is permitted.

A C average in all upper-division rhetoric courses and the designated course outside the major is required for the major program. No course taken for a passed/not passed grade will be allowed toward credit for the major.

History and Theory of Rhetoric. This area focuses upon understanding the development of rhetorical theory and practice from its genesis in the classical period to its situation in the present. Students will consider how the discipline of rhetoric has both shaped and itself been shaped by social, political, technological, and intellectual developments over the course of two millennia. Individual courses will enable close study of the process of rhetoric’s influence and adaptation, both in theory and in practice, in specific contexts throughout its history. Undergraduate courses in this area include: 104, 105T, 106, 107, 108, 109, 110, 112, 114, 116, 117, 118, 189.*

Public Discourse. This area focuses upon understanding rhetoric in its symbolic and institutional dimensions, with special emphasis on legal and political forms. Students consider the discourse of law, politics, and society both in theory and practice, in an attempt to understand the rhetorical nature of political judgment, action, justice, and legitimacy. Individual courses will enable close study of specific problems, concerns, vocabularies, modes of interpretation, and strategies of argumentation arising in public forums of the past and present. Courses in this area include: 150, 151, 152, 153, 154, 155, 156, 157A-157B, 158, 159A-159B, 160, 162AC, 164, 165, 166, 167, 168, 170, 171, 172, 176, 182, 189.*

Narrative and the Image. This area focuses upon understanding the function of rhetoric in literary, cinematic, and visual media. It places emphasis on the role of figure and image in the representation of reality. Students consider the production and reception of narrative “literature”—oral, epic, folks tale, lyric poetry of the Renaissance, and film. Three additional upper-division courses in this area include: 121, 122, 123, 124, 127B, 128T, 129, 129AC, 130, 131T, 132T, 133T, 134T, 135T, 189.*

Declaring the Major. Declare rhetoric after completing Rhetoric 10 or 20 with letter grades of C or better. Obtain a Petition to Declare the Major from the undergraduate assistant in 7407 Dwinelle Hall. Please check with the department for a more detailed description.

Passed or Not Passed. No course taken on a passed/not passed basis may be used to satisfy a requirement for the major or minor.

Honors Program. Seniors must complete Rhetoric 10, 20, 103A, and 103B and maintain a minimum 3.7 GPA in rhetoric and a 3.5 overall Berkeley GPA to undertake honors thesis research. Rhetoric 101 is the required seminar. Rhetoric 101A-H190B honors program. Students work under the supervision of a selected rhetoric faculty member. Four hours of independent study credits (2 units each semester) for the H190A-H190B sequence may be applied toward graduation as upper division units and fulfillment of one major upper division course. Honors candidates who complete the 4-unit course with a grade of A- or better and maintain the required GPAs will receive a B.A. with honors in the major.

*If course topic is appropriate.

Minor Program

The goal of the Minor Program in Rhetoric is to introduce students to the methodological procedures and interdisciplinary approach of a field that examines all disciplines from the outside and poses such questions as: How does rhetoric function (in law, or politics, etc.) constituted as a field? What kinds of discourses are considered legitimate within this field? And what kinds of knowledge are produced and institutionalized as a result? In this end, minors are required to take Rhetoric 10, 20, 103A, and 103B. This combination provides an overview of philosophic discourse; literary and cultural theory; the rhetorical approach to reading and writing; critical and social theory; rhetoric and theory of film, as well as experience in a diachronic overview of the evolution of these fields. Three further upper division electives in specific courses numbered between 182 and 189 are left to the discretion of the minor student. All courses used for the minor must be taken for a letter grade.

Graduate Program

The Department of Rhetoric offers an interdisciplinary Ph.D. program focusing on the study of rhetorical theory and the interaction of the historical concerns of rhetoric with contemporary critical theory across a broad spectrum of disciplines. Rhetoric also offers a special track for graduate students interested in pursuing a Ph.D. in the area of film studies. Crucial to the department’s approach is an investigation into the rhetorical constitution of the arguments of such fields as law, politics, literature, film, and philosophy. The interests of faculty and graduate students thus range throughout these fields and are informed by a critical interest in the rhetoric of disciplines. During their first two years, graduate students explore major areas in the history and theory of rhetoric and pursue a variety of special topics in seminars. Beginning in their fourth semester, they concentrate in greater depth on preparation for their doctoral exams and dissertation. Six semester courses are required, of which at least five must be graduate courses in rhetoric. They must include Rhetoric 200, The Origins of the Rhetorical Tradition; 205, Modern Rhetorical Theory; and a seminar offered in the department whose focus is on rhetorical matters before 1800. Because of the department’s commitment to interdisciplinary study, graduate students are encouraged at every stage of their careers to work with faculty in other departments. Please check with the department for a more detailed description.

Lower Division Courses

Check with department for exact course offerings during the year.

R1A. The Craft of Writing. (4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing requirement or UC Analytical Writing Placement Exam. Formerly 1A. Rhetorical approach to reading and writing argumentative discourse. Close reading of selected texts; written thematically focused discussion and analysis of rhetorical strategies. Satisfies the first half of the Reading and Composition requirement.

R1B. The Craft of Writing. (4) Three hours of lecture per week. Prerequisites: 1A or equivalent. For-
merly 1B. Intensive argumentative writing drawn from controversy stimulated through selected readings and class discussion. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

10. Introduction to Practical Reasoning and Critical Analysis of Argument. (4) Three hours lecture per week. An introduction to practical reasoning and the critical analysis of argument. Topics will treated include: definition, the syllogism, the enthymeme, fallacies and logical appeals. The course will treat in introductory fashion some ancient and modern attempts to relate rhetoric and logic. (F) Staff

20. Rhetorical Interpretation. (4) Three hours of lecture and one hour of discussion per week. Introduces students to the study of rhetorical interpretation—treating how the action of tropes, figures, and performance generates meaning in communication from fiction and other forms of literature to politics, to film, and to visual and material culture generally. (SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a pass/no pass basis. The Freshman Rhetoric Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Staff

30. Rhetorical Theory and Oral Argument. (4) Three hours of lecture and one hour of voluntary discussion per week. Prerequisites: 10 or consent of instructor. Examination of basic principles of rhetoric and strategies of argumentation, with practice in oral argument. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. One and one-half to four hours of seminar per week. Sections 1-3 to be graded on a letter-grade basis. Sections 4-6 to be graded on a pass/no pass basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and semester to semester. Staff

41AC. Race and Identity: Performing American Identities. (4) Three hours of lecture per week. This course focuses on the rhetorical construction of American identity. Drawing from among African American, Native American, African, Asian American, Latino, and European American oral and written cultures, the course will explore what it means to be “American.” The course will analyze and compare specific performances of identity and consider how these performances construct, maintain, and revitalize cultural and ethnic identifications. This course satisfies the American Cultures requirement. (SP) Staff

98. Supervised Group Study. (1-3) Course may be repeated for credit, One to three hours of directed group study may be taken on a pass/no pass basis. Prerequisites: Consent of advisor. Instruction for a small group of students on a topic initiated by those students. (F,SP) Staff

Upper Division Courses

Because there have been changes to major and minor requirements, check with the department for any changes in prerequisites of rhetoric courses or curriculum.

103A. Approaches and Paradigms in the History of Rhetorical Theory. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 10 or consent of instructor. Formerly 100. A broad consideration of the historical relationships between philosophy, literature, and rhetoric, with special emphasis on selected themes of the classical and medieval periods. (F) Staff

103B. Approaches and Paradigms in the History of Rhetorical Theory I. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 10 or consent of instructor. Formerly 101. A broad consideration of the historical relationships between philosophy, literature, and rhetoric, with special emphasis on selected themes within the early modern and modern periods. (SP) Staff

104. Rhetorical Theory and Practice in Historical Eras. (4) Course may be repeated for credit with different instructor. Three hours of lecture per week. Formerly 105. An examination of the relations between rhetoric, discourse, and knowledge in selected historical eras, for example, the Renaissance, Atlantic Enlightenment, or Victorian Britain. (F,SP) Staff

105T. Rhetoric of Religious Discourse. (4) Three hours of lecture per week. Formerly 131. Consideration of the rhetoric of hermeneutics or biblical interpretation with special emphasis on the mystical, symbolic, and allegorical language as the bearer of persuasive intent. (F,SP) Staff

106. Rhetoric of Historical Discourse. (4) Three hours of lecture per week. Formerly 173. A study of how historical knowledge is produced and interpreted. Topics might include narrative and representation, the uses of evidence, forms of historical argumentation, and historical controversies in the public realm. (F,SP) Staff

107. Rhetoric of Scientific Discourse. (4) Three hours of lecture per week. Formerly 174. Examination of the characteristic functions of discourse in and about the natural sciences; with particular examination of the ways in which scientific language both guarantees and, at the same time, obscures the expression of social norms in scientific facts. (F,SP) Staff

108. Rhetoric of Philosophical Discourse. (4) Three hours of lecture per week. Formerly 175. Introduction to theoretical issues involved in applying rhetorical analysis to philosophical discourse; intensive analysis of selected lectures. (SP) Staff

109. Aesthetics and Rhetoric. (4) Three hours of lecture/discussion per week. Prerequisites: Any 1A-1B sequence, upper division standing, and consent of instructor. Formerly 140. Study of the terms and means by which we make and defend judgments involving the exercise of aesthetic sensitivity or perceptiveness. Consideration of the relationship between aesthetic qualities and aesthetic value. Discussion of aesthetic and ethical criticism as the means of determining the capacities and salience of works of art are called to our attention and brought into focus. Topics include questions of taste, expression, and affect. (F,SP) Staff

110. Advanced Argumentative Writing. (4) This course is equivalent to 110M. Three hours of lecture per week. Formerly 176. Prerequisites: Any 1A-1B sequence or upper division standing. Study and practice of advanced techniques of argumentation for students with well-developed writing skills. Ethical, logical and pathetic appeals; control of register and tone; assessment of a wide variety of real audiences; genre studies. (F,SP) Staff

112. Rhetoric of Narrative Genres in Nonliterate Societies. (4) Course may be repeated for credit with different instructor. Three hours of lecture per week. Formerly 139. Rhetorical analysis of autobiographical, fictional narratives. Definition and techniques including literary interactive fiction, and socially constructed narratives. (SP) Staff

113. Language, Truth and Dialogue. (4) Three hours of lecture per week. Formerly 177. Examination of philosophical dialogues from Plato to Heidegger. Focus on the interaction within the dialogue, the participation required of the reader/listener, and the relation of such interaction and participation to thinking, speaking, and knowing. Staff

114. Undergraduate Seminar on the Theory and Practice of Reading and Interpretation. (4) Three hours of lecture per week. Prerequisites: Any 1A-1B sequence and consent of instructor. Formerly 181. An introduction to contemporary modes of reading and interpretation in the humanities from structuralism through psychoanalysis, with an emphasis on theories of the sign (semiotics). Examples drawn from such fields as contemporary literature, architecture, history, painting, film, and popular culture. Staff

115. Rhetoric of Fiction. (4) Three hours of lecture per week. Prerequisites: 10 or 1A-1B sequence or consent of instructor. Study of the form and content of fictional narratives. Definition and techniques including voice, point of view, and time orders. Attention to cultural and historical context of selected works. Students are to consider interplay of works, authors, and readers. (F,SP) Staff

116. Rhetoric of Performance. (4) Three hours of lecture per week. Prerequisites: Any 1A-1B sequence, upper division standing, and consent of instructor. Course introduces students to the interdisciplinary field of performance studies. While themes may vary, the course considers disciplinary genealogies from the performing arts, social sciences, and speech-act theory to investigate the many ways in which people create and define themselves and their world through performance. (F,SP) Staff

117. Rhetoric of Poetry. (4) Three hours of lecture per week. Prerequisites: 30. Consideration of the relationship between the texture of poetic discourse largely defined by figures of speech and overall poetic structures. (SP) Staff

118. Novel, Society, and Politics. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. This course examines the complex links between novelistic literature, society, and politics. Topics may include the social and political vocation of the Bildungsroman and the realist novel; autobiography and the rise of liberal individualism; the role of the novel in imagining the nation. (F,SP) Staff

119. The Rhetoric and Politics of Interviews. (4) Three hours of lecture per week. Prerequisites: 1A-1B sequence or 10 or 20, or consent of instructor. As a common form of interacting, documenting, and informing, the interview plays a central role in the process of social and cultural inquiry. The interview is here not only studied in its popularized use as a form of oral witnessing and of privileged access to persons. It is also explored in its critical and potentially creative dimensions as part of a mise-en-scène or a setting in which interviewer and interviewee function as social actors. (F,SP) Staff

120. Rhetoric of Autobiography. (4) Three hours of lecture per week. Prerequisites: Upper division standing. Formerly 139. Rhetorical analysis of autobiographical discourse, with specific attention to the evolution of the genre in relation to changing modes of human subjectivity. Staff

129. Autobiography and American Individualism. Three hours of lecture per week. Prerequisites: Upper division standing. Formerly 139AC. Rhetorical analysis of autobiographical discourse in American cultures, with special attention to the ide-
ology of individualism. This course satisfies the American Cultures requirement. (F.SP)  

130. Novel into Film. (4) Three hours of lecture per week. Formerly 128. Close examination of the adaptation of written fiction to the cinema. Focus on the transformation of five novels, which will be read, into their filmed versions. (F.SP) Staff  

131T. Genre in Film and Literature. (4) Course may be repeated for credit. Three hours per week plus film screenings. Prerequisites: Consent of instructor. Staff  

132T. Auteur in Film. (4) Course may be repeated for credit as topic varies. Three hours per week plus viewings. Prerequisites: Upper division standing. Formerly 133. The study of films from the perspective of directorial style, theme, or film-making career. This course considers a single director or the textual strategies of important writers. Staff  

133T. Theories of Film. (4) Three hours of lecture per week plus viewing sessions. Prerequisites: One UC film course. Formerly 129. Classical theories of film by Eisenstein, Antheil, Kracauer, Bazin, Metz, and others. Only one or two films will be analyzed in great depth in the power of various theories. Staff  

135T. Selected Topics in Film. (4) Course may be repeated for credit as topic varies. Three hours per week plus viewing sessions. Prerequisites: Upper division standing. Formerly 133. A study of a film topic not covered in the five film categories. This course might focus on a particular cinematic "theme," or a non-historic and non-generic category. Examples: feminist film practice, gay and lesbian cinema, race and cinematic representation. Staff  

150. Rhetoric of Contemporary Politics. (4) Three hours of lecture per week. Examination of the characteristic rhetoric of a variety of manifestations of modern politics. Emphasis on building a theoretical foundation for critically observing and participating in the contemporary political process. (F.SP) Staff  

151. Rhetoric of Contact and Conquest. (4) Three hours of lecture per week. Prerequisites: 10 or 20 and R1A-R1B sequence. This course charts the discovery and conquest of the New World; it treats the ways in which world peoples were understood and exploited—by Europeans. It explores not only questions relating to the origins of New World peoples but also climate and zonal theories of race, and racial ideograms of degeneration and corruption. In examining Europe’s multivalent relationship with the “other,” the course investigates the legal, moral, and spiritual status of New World peoples. (F.SP)  

152. Rhetoric of Constitutional Discourse. (4) Three hours of lecture per week. The rhetorical context of the tradition of Anglo-American constitutional argumentation in the 18th century, its sources, and its implications. Readings include Locke, Hume, Montesquieu, pamphlets of the American Revolution, and Anti-Federalist writings. Staff  

152AC. Race and Order in the New Republic. (4) Four hours of lecture per week. This course will explore how the social issue of race in the New American republic shaped the political founding of the United States in 1787. We will investigate perceptions of race, race founding, and to understand the origins of those perceptions. We will examine how those same perceptions affected the founding and establishment of a new nation and how they have ultimately informed modern discriminatory and political discourse. This course satisfies the American Cultures requirement. (F.SP) Staff  

153. American Political Rhetoric. (4) Three hours of lecture per week. A survey of the ways in which Americans have discussed their existence as a distinct nation through the rhetoric of their wars, and the legitimation and modes of political action open to them. Readings cover the 17th through the 20th centuries and may include discussion of convening, novels, philosophy, social and political theoretical treatises, declassified government planning documents, Congressional testimony, and films. Staff  

154. Discourses of Colonialism and Postcoloniality. (4) Course may be repeated for credit. Three hours of lecture per week. This course critically explores key discourses used in the public discourses of European colonialism to justify territorial expansion in the 19th century such as “race,” “culture,” “civility,” and “the Orient” and their disturbing legacies for current social, cultural, and political projects, and problems of contemporary postcolonial societies in a globalizing world. (F.SP) Staff  

156. Rhetoric of the Political Novel. (4) Three hours of lecture per week. Investigation of major 19th- and 20th-century works of fiction in which political standpoints are exploited as dominant themes; close reading of atherial viewpoints and rhetorical strategies. Staff  

157A. Rhetoric of Modern Political Theory. (4) Three hours of lecture per week. Formerly 157. Study of the textual strategies of important works of modern European and American political theory from the 17th through the 19th centuries. Staff  

157B. Rhetoric of Contemporary Political Theory. (4) Three hours of lecture per week. Study of the textual strategies of important works of 20th century European and American political theory. (F.SP) Staff  

158. Advanced Problems in the Rhetoric of Political Theory. (4) Three hours of lecture per week. Close study of works of modern political theory, including debates over the nature and interpretation of political theory and the role of the political theorist. Specific themes and readings vary from year to year. (F.SP) Staff  

159A. Great Theorists in the Rhetoric of Political and Legal Theory. (4) Three hours of lecture per week. Prerequisites: Permission of instructor. This course explores the development of one or two theorists or an important theme or issue, with close readings of major texts as well as attention to important commentators. Staff  

159B. Great Themes in the Rhetoric of Contemporary Political and Legal Theory. (4) Three hours of lecture per week. Prerequisites: Permission of instructor. This course will examine works of contemporary political theory, focusing on the rhetorical themes and techniques that lie at the heart of works such as the work of Habermas, Foucault, and Miranda. (F.SP) Staff  

160. Introduction to the Rhetoric of Legal Discourse. (4) Three hours of lecture per week. Prerequisites: 10. The application of rhetorical methodology to all categories of legal texts. (F.SP) Staff  

162AC. Rhetoric of American Culture. (4) Three hours of lecture/discussion per week. Prerequisites: Upper division standing. This course explores the ways laws and regulations in the United States identify and classify—or fail to identify and classify—groups in American society. Readings include a wide array of theoretical and historical materials as well as legal and governmental documents. This course satisfies the American Cultures requirement. Staff  

164. Rhetoric of Legal Theory. (4) Three hours of lecture per week. Rhetorical methodology applied to close analysis of the argumentative framework of important works in modern legal theory. (F.SP) Staff  

165. Rhetoric of Legal Philosophy. (4) Three hours of lecture per week. Consideration of basic philosophical issues underlying legal and moral foundations of the law. (F.SP) Staff  

166. Rhetoric in Law and Politics. (4) Three hours of lecture per week. Prerequisites: 160 or consent of instructor. Examination of the role of rhetoric in the legal and political thought of a particular era or culture. Course may compare societies or periods. All foreign texts will be studied in English translation. (F.SP) Staff  

167. Advanced Themes in Legal Theory, Philosophy, and Argumentation. (4) Three hours of lecture per week. Further consideration of particular rhetorical themes in the field of legal theory, legal philosophy, and legal argumentation. (F.SP) Staff  

168. Advanced Topics in Contemporary Law and Social Discourse. (4) Three hours of lecture per week. Prerequisites: 160, consent of instructor. Thorou- gh consideration of particular rhetorical themes in the fields of contemporary law and legal discourse. Staff  

170. Rhetoric of Social Science. (4) Three hours of lecture per week. Analysis of the ways in which political scientists, sociologists, anthropologists, economists, and psychologists establish the authori- tative nature of their claims. Focus is on the presentation of data as fact, the use of quantitative methods, and other “strategies” through which social knowledge is transformed into objective information. Staff  

171. The Problem of Mass Culture and the Rhetoric of Social Theory. (4) Three hours of lecture per week. Critical examination of the textual strategies whereby the masses and mass culture emerge as objects of anxiety, hope, and scrutiny for social theorists of the 19th and 20th centuries. Staff  

172. Rhetoric of Social Theory. (4) Three hours of lecture per week. Theoretical analysis of theorists from Durkheim and Weber, Engels, Marx, Ricardo and Bentham, to contemporary representatives of social and economic thought. Staff  

176. Rhetoric of Material Culture. (4) Three hours of lecture per week. Prerequisites: 10 or 20 and R1A-R1B sequence. Where did the first collections originate? Why did people begin to collect? How did— and do—museums and museum collections contribute to the definition of the cultural values/power of elite groups? How do we define ourselves—as citizens, as members of a discipline or tribe, as nations—with reference to collections? What values/ideologies structure the debates and conflicts over definition, meaning, and ownership of cultural resources? We will try to answer in the class. (F.SP)  

182. Rhetorics of Sexual Exchange and Sexual Difference. (4) Course may be repeated for credit. Three hours of lecture per week. Formerly 179. This course examines the centrality of sexual difference in the interplay between political, legal, social, cultural, and political life. Possible topics include theories of desire and corporeality; the figure of woman as object of exchange in historical and contemporary contexts such as in slavery, prostitution, and IVF, and the global traffic in female labor; and an examination of how sexual difference functions as a blind-spot in theories of culture, society, and economy. (F.SP) Staff  

189. Special Topics. (4) Course may be repeated for credit. Three hours of lecture per week. Group instruction and investigation of topics not accommodated in regular course offerings. (F.SP)  

H190A-H190B. Honors Thesis. (2;2) Tutorial. Students must take 2 units of H190A and 2 units of H190B. Credit and grade to be awarded on completion of sequence. Prerequisites: Senior standing with a 3.7 GPA in rhetoric and 3.5 GPA overall. Formerly H190A. Independent study under guidance of a faculty director culminating in a written thesis. Required of all rhetoric majors desiring to earn the A.B. degree with honors. (F.SP) Staff  

197. Field Studies. (1-3) Course may be repeated for credit. Two to six hours of fieldwork per week. Must be taken on a passed/not passed basis. Super- vision of field work in an on- or off-campus business. Field work should be relevant to themes or topics covered in the undergraduate curriculum studied in the department. Additional meetings with faculty spon-
240D. Nonfictional Prose. (4) Staff
240E. Political Discourse. (4) Staff
240F. Legal Rhetoric and Philosophy. (4) Staff
240G. Rhetorical Theory. (4) Staff

243. Special Topics in Film. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week plus two film viewings. Prerequisites: Graduate standing. A theoretical examination of a film topic which falls outside the purview of traditional categories of film analysis, such as "genre," "history," or "theory." Examples: Rainer Werner Fassbinder, the essay film, feminist film practice, cinema and the phantasmagoria of history. Staff

244. Special Topics in Rhetoric: Limited study. (2) Course may be repeated for credit. Four hours of seminar for six weeks. This course studies various modes of rhetorical discourse. Specific topics to be announced. (F.SP)

250. Rhetoric of the Image. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. Prerequisites: Graduate standing and consent of instructor. A study of the visual image as a mode of discourse, together with an analysis of the terms in which images have been interpreted and criticized. Focus may be on the rhetoric of a particular medium or set of images, or on more broadly theoretical writings about image. (F.SP) Staff

280. Research Methods for Dissertation Writing. (3) Three hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate standing and consent of instructor. This seminar is designed to help ABD students at the initial stage of dissertation writing to construct a detailed plan for dissertation research and to complete a dissertation prospectus. Earlier meetings will be devoted to library research methods, working with electronic databases, the collection and analysis of data, and the compilation of a bibliography. A session will also be devoted to the appropriate format, style, and structure of a dissertation-length scholarly work as well as systems of citation and reference in both the social sciences and the humanities. The final part of the course will be devoted to the discussion of drafts of dissertation prospectuses. (F.SP) Staff

295. Special Study. (1-6) Course may be repeated for credit. Individual tutorial. Prerequisites: Graduate adviser approval. Open to qualified graduate students wishing to pursue special topics under the direction of a member of the staff. (F.SP) Staff

299. Directed Research. (1-12) Course may be repeated for credit. Individual tutorial. Prerequisites: Graduate adviser approval. Open to graduate students who have passed their Ph.D. qualifying examinations. (F.SP) Staff

601. Individual Study for Master's Students. (1-6) Course may be repeated for credit. Individual arrangement. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status. Individual study for degree or language examinations in consultation with staff member. (F.SP) Staff

602. Individual Study for Doctoral Students. (1-6) Course may be repeated for credit. Individual arrangement. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate status. Individual study in consultation with faculty director as preparation for degree examinations. (F.SP) Staff

Professional Courses

300. Problems in Teaching Rhetoric. (2) Three hours of seminar per week must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Appointment as teaching assistant. Instruction in teaching argumentative writing and rhetorical analysis. (F.SP) Staff

Romance Languages and Literatures

Graduate Office: 5309 Dwinelle Hall, (510) 642-8037 spanish-portuguese.berkeley.edu/grad/grad_pages/pbdrlt.html

Advisers
Albert R. Ascoli, Ph.D. (Italian Studies)
Steven Bottieri, Ph.D. (Italian Studies)
Uma Doughtery, Ph.D. (Spanish and Portuguese)
David F. Hult, Ph.D. (French)
Ignacio Navarrete, Ph.D. (Spanish and Portuguese)
Nicholas Paige, Ph.D. (French)

Ph.D. Program

The Ph.D. in Romance Languages and Literatures is a doctorate in three Romance languages and literatures (French, Italian, and Spanish, including Spanish-American), prepared with emphasis in the literature or the linguistics or philological history of one of the three. The program is intended to afford students the opportunity to undertake more detailed comparative studies among the Romance languages and their literary cultures than is normally the case in any single department’s program. It is founded upon the belief that a truly comprehensive understanding of any of the major Romance languages and its literature must be nourished by a substantial degree of familiarity with all of them.

Students choose from among three plans whose prerequisites vary slightly. Plans I and II require a B.A. degree with studies in Spanish, Italian, or French, approximately equivalent to the undergraduate major at Berkeley (30 upper division semester units). Plan III requires either a B.A. degree with studies in Spanish, Italian, or French, as for Plans I and II, or a B.A. in linguistics with expertise in at least two major Romance languages.

Students are admitted for one of the three plans and present a combination of courses and personal study to satisfy the requirements of the particular plan chosen, developed in consultation with a graduate adviser and designed to prepare the students for the qualifying examination. Students designate one Romance field (choosing from among French, Italian, or Spanish and Spanish-American) as their emphasis; the remaining two languages and literatures are designated “collaterals.” Applications for admission should be submitted to the department of the language and literature of major emphasis.

Plan I: Requires a detailed knowledge of the major language and a detailed knowledge of the first collateral literature as prescribed in a supplied reading list of 15 items, and knowledge of the master works of the second collateral as prescribed in a reading list of 10 items. In addition, familiarity with the linguistic history of the Romance languages, with emphasis on the major language, is required.

Plan II: Requires a detailed knowledge of the major literature and a detailed knowledge of the first and second collateral literature as prescribed in a supplied reading list of 15 items, and knowledge of the master works of both the collaterals (15 and 10 items, respectively) are to be developed by the student, as advised and approved by a faculty member of the department concerned. Familiarity with the linguistic history of the Romance languages, with emphasis on the major language, is also required.

Plan III: Requires an in-depth knowledge of the structure and history (internal and external) of the major language, and an in-depth knowledge of either the history or the structure, depending on whether the student’s preferred orientation is dia-
chronic or synchronic of the Romance language designated as first collateral.

Students are given three options with respect to the second collateral: (1) familiarity with the history and structure of the third language; (2) familiarity with the history and structure of a related Romance language (Catalan, Galician, Occitan, Portuguese, Rumanian, or Romance-based Creoles); (3) a broadly defined field of linguistics (phonology, morphology, semantics, pragmatics, sociolinguistics), philology (textual criticism, medieval literature), or the application of linguistics to literature, the field to be chosen by the student in consultation with a graduate adviser. Students will develop an individually tailored reading list for the option they choose, in consultation with and approved by an appropriate faculty member. The course entitled Linguistic History of Romance Languages, taken as either French C202, Italian C201, or Spanish C202, is also required.

In all plans, work beyond the requirements may be added in other Romance fields (such as Catalan, Portuguese, Occitan, or Rumanian).

General Requirements

For all plans include fluency in the major language and reading knowledge of the collateral languages as well as Latin. Students must show a reading knowledge of any one of the languages by passing a written examination that is the Department of Spanish and Portuguese coordinates for the program. For the remaining two, students may demonstrate reading knowledge by: written examination; holding a graduate student instructorship in the language in question; passing, with a grade of B or better, an upper division or a graduate-level course in the literature of those languages; or, in the case of Latin, passing Latin 1 and 2. A reading knowledge of Greek is recommended.

Students in all three plans must also demonstrate knowledge of the linguistic history of the Romance languages. Students in Plans I and II are offered the option of satisfying this requirement either by: (1) passing, with a grade of B or better, the graduate course entitled Linguistic History of Romance Languages (French C202; Italian C201, or Spanish C202); or (2) examination during the qualifying examination. Study is guided, in the second case, by a standard reading list. The course is a required part of the program for students in Plan III.

Students in all plans take a qualifying examination. The qualifying examination committee is composed of a minimum of five members: three representatives of the student's major field of focus, a graduate student "outside" member from the student's first collateral, and one additional member representing the second collateral. This examination is oral and normally three hours long.

Once students successfully complete the qualifying examination, they will arrange with a faculty member to direct the dissertation and will propose the remaining members of the dissertation committee to the director. The dissertation is expected to embody the results of original research on a subject chosen in consultation with the director.

The normative time allowance for completing the doctoral program is six years.

Graduate Courses

Students in the Romance languages and literatures degree program draw upon the full range of courses offered by the Departments of French, Italian Studies, and Spanish and Portuguese. Refer to department listings in this catalog.

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Scandinavian (College of Letters and Science)
Department Office: 6303 Dwinelle Hall, (510) 642-4484
Chair: Linda Rugg, Ph.D.

Professors
John Lindow, Ph.D. Harvard University. Philology, folklore, medieval literature, textual criticism
Mark Sandberg, Ph.D. University of California, Berkeley. Film history, Norwegian literature, Scandinavian drama, visual culture, historiography
Karin L. Sanders, Cand. mag. University of Copenhagen. Danish literature, intertext studies, Scandinavian gender studies

*Carol J. Clover (Emerita), Ph.D.
Eric O. Johannessen (Emeritus), Ph.D.
James L. Larson (Emeritus), Ph.D.

Associate Professors
Daniel F. Meila, Ph.D. Harvard University. Oral literature, Celtic folklore
Linda Haverty Rugg, Ph.D. Harvard University. 19th- and 20th-century Swedish literature, comparative literature, folkloristics, photography, film
Gregory P. Nybo (Emeritus), Ph.D.

Lecturers
Karen Moller, Cand. Phil. University of Copenhagen. Language coordinator, Nordic philology
Sirpa Tuohiainen, M.A. San Francisco State University. English as a second foreign language

Major Adviser: Mr. Lindow
Graduate Adviser: Ms. Sanders

Department Overview

The Department of Scandinavian offers undergraduate and graduate instruction in the languages, cultures, and literatures of northern Europe. Languages taught are Danish, Finnish, Norwegian, Swedish, and Old Norse-Icelandic. Lower-division reading and composition courses based on Scandinavian languages, cover a wide variety of topics. The undergraduate major involves a program integrating the study of Danish, Finnish, Norwegian, or Swedish language with important aspects of Scandinavian culture and literature, and an undergraduate minor is also available. The graduate program leads to the Ph.D.

The department also administers the program in Celtic Studies (see separate listing in this catalog).

The Major

The major emphasizes one of four Scandinavian languages (Danish, Finnish, Norwegian, or Swedish), but in their coursework students explore all phases of Scandinavian literature and cultural history from the medieval to the modern across national boundaries. The major affords students the opportunity to pursue interdisciplinary interests through Scandinavian department courses and through double majors with other fields. Several of the areas in which the University of California has made a major contribution to Western culture are history, drama, medieval literature, folklore, architecture, public policy, linguistics, international studies, peace studies, political science, film, economics, and environmental studies. Students should consult with the undergraduate faculty adviser early on for advising and course planning to assist in achieving their goals.

Total units for the major: 46

Upper Division (18 units). Nine upper division courses taken from the following:

(1) Two courses of one advanced-language course sequence: Scandinavian 100A-100B (equivalent of intermediate/advanced Danish, Norwegian, or Swedish, 4 units each), or Scandinavian 102A-102B (equivalent of intermediate/advanced Finnish, 4 units each).

(2) Two history courses from the following: Scandinavian 123, 127, or 125 (4 units each).

(3) Five courses in literature, culture, or folklore chosen from the following: Scandinavian 106, C107, C108, C114, 115, 116, 117, 125, 127, 128, 132, 140A, 140B, 150, C160, 165, 170, or 180 (4 units each).

Note: The undergraduate faculty adviser may approve substitutions for relevant courses taken in other departments or colleges or from the Education Abroad Program. Since Scandinavian 140A-140B is not offered consistently, the upper division courses listed under literature, history, culture, or folklore can be used as substitutes by permission of the undergraduate faculty adviser.

(4) Two courses of Scandinavian 149, Major Research (1 unit each). In addition to the nine upper division courses above, students must also take two 1-unit courses of Scandinavian 149, Major Research, in conjunction with any of the upper division courses listed under literature, history, culture, or folklore. These 149 research courses must be taken by permission of the relevant instructor and the undergraduate faculty adviser.

Current majors will also want to consult the link on our website detailing upcoming courses.

Honors Program. Students must complete with distinction the courses required for the major as well as two semesters of Scandinavian 145, Senior Seminar. A thesis is also required.

The Minor

Total units for the minor: 20

Required Courses: Five upper division courses chosen in consultation with the undergraduate faculty adviser:

(1) Minimum of one course in Scandinavian history: 123, 127, or 128.

(2) Four electives.

Competency in a Scandinavian language is not required to take our upper division courses, which are usually taught in translation. Students interested in learning a Scandinavian language, however, may count both 100A and 100B (the second year courses in Danish, Norwegian, or Swedish) or 102A and 102B (second year courses in Finnish) toward the five course requirement.

Note: Students with credit from education abroad courses should consult with the undergraduate faculty adviser for help in determining requirement equivalencies.

Education Abroad Program

The University of California offers students the opportunity of studying abroad in Sweden (Lund University) and Denmark (University of Copenhagen). These programs feature language study with courses in culture, history, literature, architecture, and other areas within the humanities and social sciences. Many of the courses may be applied toward language courses and upper division credit in the major or minor. Students must consult with the undergraduate faculty adviser for approval before they leave. Details for programs are available from Berkeley Programs for Study Abroad, 160 Stephens Hall; (510) 642-1356; or studyabroad.berkeley.edu.
Graduate Program

The graduate program in Scandinavian is designed for future scholars and teachers in the fields of Scandinavian language, literature, and cultural history. The department's strengths lie in the areas of modern literatures and film (Danish, Norwegian, and Swedish), and Old Norse, folklore, and intellectual and cultural history. The department is willing to consider applications from students with special interests in areas such as Scandinavian film, art, and history. Prospective applicants interested in studying the great literature and language of the Middle Ages (Danish, Norwegian, or Swedish) will find this department an excellent place to pursue their work.

Preparation. Prospective graduate students should have a strong knowledge of one Scandinavian language, a good reading ability in at least one other Scandinavian language, and knowledge of the broad outline of Scandinavian literary, cultural, and intellectual history. The A.B. in Scandinavian, or its equivalent, is ordinarily prerequisite to admission. Students with less preparation may be admitted under the stipulation that deficiencies be corrected.

Master of Arts. Note: The department does not accept applications for the M.A. as an ultimate degree goal. An M.A. examination is administered and degree conferred subject to satisfactory performance as a first step in the Ph.D. program. The curricular requirements are intended to give broad coverage of a major field (e.g., Danish literature, Old Norse) and less extensive coverage of a second field (e.g., Danish novel, Romanticism, saga). General requirements: 24 units in Scandinavian, including at least 12 graduate units.

Courses from other departments may be accepted with the consent of the graduate adviser. An examination will test the student's knowledge of both the major and the minor fields with emphasis upon the literature in the major language.

The Ph.D. in Scandinavian. General requirements: An M.A. in Scandinavian, or equivalent preparation, is prerequisite. Students must complete two semesters of work in Old Norse and submit three field papers as examples of their scholarly ability. There are no other specific requirements as to graduate coursework at this level, but students should enroll in units according to Graduate Division guidelines, keeping in mind that continued seminar work will benefit them in taking their Ph.D. qualifying examinations. Seminar courses will also help students establish the skills necessary to write a dissertation and publish scholarly work while forging collegial relationships with graduate student colleagues and faculty. Students will be encouraged to develop their ability to read and interpret Old Norse, with a group of peers in a small-seminar setting. These seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

Lower Division Courses

1A. Beginning Swedish. (4) Three hours of language instruction and one hour of computer laboratory per week. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (F) Staff

2B. Beginning Finnish. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: A1 or consent of instructor. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (SP) Tuomainen

3A. Beginning Norwegian. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: A1 or consent of instructor. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (SP) Staff

3B. Intermediate Norwegian. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: 3A or consent of instructor. Students in this seminar will write the term paper on a topic of their choosing. (F) Staff

4A. Beginning Danish. (3) Three hours of language instruction and one hour of computer laboratory per week. Students will develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (F) Staff

4B. Intermediate Danish. (4) Three hours of language instruction and one hour of computer laboratory per week. Prerequisites: 4A or consent of instructor. Students will continue to develop the basic elements of communicative competence in both the spoken and written language within a cultural context. (F,SP) Staff

5A. Reading and Composition. (4) Three hours of lecture per week. Prerequisites: UC Entry-Level Writing requirement or equivalent. Formerly 5A. Reading and composition in connection with the representation of Scandinavia by outsiders and insiders. Satisfies the first half of the Reading and Composition requirement. (F,SP) Staff

5B. Reading and Composition. (4) Three hours of lecture per week. Prerequisites: RSA or equivalent. Formerly 5B. Reading and composition in connection with the representation of Scandinavia by outsiders and insiders. Satisfies the second half of the Reading and Composition requirement. (F,SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP) Staff

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. One hour of lecture per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollments are set by the faculty, but the suggested limit is 25. (F,SP) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Freshman or sophomore standing. Group study of selected topics not covered by regularly scheduled courses. (F,SP) Staff

Upper Division Courses

100A. Scandinavian Languages and Linguistics. (4) Two hours of language instruction and one hour of lecture in the cultural component per week. Prerequisites: 1B, 3B, or 4B, or consent of instructor. Formerly 1, 13, 14. In the context of inter-Scandinavian communication, students will further develop their communicative competence, their reading and writing abilities and cultural understanding in their own target language (Danish, Norwegian, or Swedish). Workload: three hours of work outside class per week with one hour of individual work in the Berkeley Language Media Center. Oral and written midterm and final. (F) Staff

100B. Scandinavian Languages and Linguistics. (4) Two hours of language instruction and one hour of lecture in the cultural component per week. Prerequisites: 100A or consent of instructor. Formerly 101, 103, 104. In the context of inter-Scandinavian communication, students will further develop their communicative competence, their reading and writing abilities and cultural understanding in their own target language (Danish, Norwegian, or Swedish). Students will read and interpret literary and nonliterary texts from a cultural perspective. Workload: Two to three hours of work outside class per week with one hour of individual work in the Berkeley Language Media Center. Final: [Group project producing a video interview with local Scandinavian immigrants. Oral and written midterm and final. (SP) Moller

102A-102B. Advanced Finnish. (4) Course may be repeated for credit. Four hours of language instruction per week. Prerequisites: 102A: 2B or consent of instructor; 102B: 102A or consent of instructor. Formerly 12 and 102. Students will focus on acquiring communicative competence necessary to function in modern situations of language use in terms of grammatical, functional, and sociolinguistic skills. Students will read and interpret literary and nonliterary texts from a cultural perspective. The course uses a flexible approach that uses a casebound and independent study approach to advanced language study. (F,SP) Tuomainen

106. The Works of Hans Christian Andersen. (4) Three hours of lecture per week. Reading and discussion of Hans Christian Andersen’s major works, including fairy tales, short stories, novels, autobiographies, and diaries. Reading and discussion in English. (F,SP) Sanders

C107. Plays of Ibsen. (4) Three hours of lecture/discussion per week. Reading and discussion of Ibsen’s major plays. Readings and discussion in English. Also listed as Theater, Dance, and Performance SC107. (F,SP) Sandberg

108. Strindberg. (4) Three hours of lecture per week. Reading and discussion of Strindberg’s major works; emphasis on his dramas and their significance. Readings and discussion in English. Also listed as Theater, Dance, and Performance ST C108. (F,SP) Staff

C114. Word and Image. (4) Three hours of lecture per week. This course is designed to sharpen our skills in understanding what happens when the world of images and words meet. Starting with work from the Western “classics,” we will proceed to investigate how word/image constellations operate in a variety of media, including sculpture and poetry, painting and prose, death masks, tableaux vivants, photography, and advertising. Also listed as Interdisciplinary Studies Field Maj C100C. Sanders

115. Studies in Drama and Film. (4) Course may be repeated with consent of instructor. Three hours of lecture/discussion per week. Variable subject matter; see departmental announcement for description. Sample topics: history of Scandinavian drama; history of Scandinavian cinema; 20th-century drama; the films of Ingmar Bergman and Carl Dreyer. Readings and discussion in English. (F,SP) Staff

116. Studies in Prose. (4) Course may be repeated with consent of instructor. Three hours of lecture/discussion per week. Variable subject matter; see departmental announcement for description. Sample topics: Knut Hamsun, Kierkegaard, H. C. Andersen, Isak Dinesen, Strindberg. Readings and discussion in English. (F,SP) Staff

120. The Novel in Scandinavian. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Reading and discussion of the great Scandinavian novels; the development of the novel. Readings and discussion in English. (F,SP) Staff
123. Viking and Medieval Scandinavia. (4) Three hours of lecture/discussion per week. Internal and external history of Scandinavian culture and civilization from the eighth century through the 15th century. Readings and discussion in English. (F,SP) Lindow

125. Old Norse Literature. (4) Three hours of lecture/discussion per week. Reading and discussion of some of the Icelandic sagas and selections from the Eddas and skaldic verse. Readings and discussion in English. (SP) Lindow

127. Scandinavian from 1520-1800. (4) Three hours of lecture and one hour of discussion per week. Scandinavian society, history, and culture from the Reformation through the Enlightenment. Staff

132. Introduction to Finnish Culture and History. (4) Three hours of lecture per week. Finnish culture, history, society, and arts. Readings and discussion in English. (SP) Lindow

145. Senior Seminar. (2) Course may be repeated for credit. Two hours of seminar per week. Prerequisites: 140A-140B. Intensive study of a single topic, several reports, a longer paper. (F,SP) Staff

149. Major Studies. (1) One hour of discussion per week. Prerequisites: Knowledge of a Scandinavian language. Additional work for majors in Scandinavian and other qualified students with permission of the instructor, in connection with one of the following: Scandinavian C108, 115, 116, 117, 120, or 165. Students attend lectures and do all written work in the "main" course and also read assignments in the Scandinavian languages and write a short paper. (F,SP) Staff

150. Studies in Scandinavian Literature. (4) Three hours of lecture per week. Variable subject matter; see departmental announcement for description. Sample topics: Scandinavian romanticism; the Modern Breakthrough; literature by and about women; the political tradition. Readings and discussion in English. (F,SP) Lindow

165. Scandinavian Folklore. (4) Three hours of lecture per week. Scandinavian folklore, emphasizing oral narrative traditions (legends and folk belief, folklore Contents. Such minor verbal forms as proverbs, riddles, and formulas will also be considered. Readings and discussion in English. (SP) Lindow

170. Arctic Folklore and Mythology in Nordic Lands. (4) Three hours of lecture per week. Survey of the language and history of the ancient Scandi- navian peoples of the Nordic lands: Finns, Saami, Greenland, Inuit. Comparative evidence from other circumpolar traditions and from ancient and modern Scandinavian traditions. Readings and discussion in English. (SP) Lindow

190AC. Special Topics in Scandinavian and American Cultures. (4) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Topics on ethnic relations in the United States, with special emphasis on the experience of Scandinavians in America. Topics will vary but may include the study of whiteness and its boundaries, passing and masquerade in film and literature, ethnic identity in the American Multiverse, etc. This course satisfies the American Cultures requirement. (F,SP) Rugg

198. Group Study for Advanced Undergraduates. (2-4) Course may be repeated for credit. Directed study. Must be taken on a passed/not passed basis. Prerequisites: Two years study of one Scandinavian language. Advanced readings and interpretation of Scandinavian texts. (F,SP) Staff

199. Independent Study and Research. (2-4) Course may be repeated for credit. Directed study. Must be taken on a passed/not passed basis. Prerequisites: Two years study of one Scandinavian language. Courses in Scandinavian literature, culture, or history. Supervised study; restricted enrollment. (F,SP) Staff

Graduate Courses

201A. Old Norse. (4) Three hours of lecture per week. An introduction to the language of medieval Iceland and Norway. Grammar, historicalphonology, and texts. (F) Lindow

201B. Norse Literature. (4) Three hours of lecture per week. Prerequisites: 201A or equivalent. Literature and production of early Iceland and Norway. Reading of representative texts in the original. (SP) Lindow

206. Studies in Philology and Linguistics. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. Ad- ministration of selected courses. Sample topics: runology; history of the Scandinavian languages; dia- lectology. Lindow

220. Early Scandinavian Literature. (4) Three hours of lecture per week. Prerequisites: 201A or equivalent. Variable subject matter; see department announcement for description. Course normally focuses on one of two areas: Eddic and skaldic poetry; or sagas (royal family, legendary, courtly, episocal). (SP) Lindow

235. Studies in Romanticism and Realism. (4) Course may be repeated for credit. Three hours of lecture per week. Course in the literature and art of the 19th century. Topics vary from semester to semester; see department announcement for description. (F,SP) Staff

240. Modern and Contemporary Scandinavian Lit- erature. (4) Course may be repeated for credit. Three hours of lecture per week. Reading and discussion of representative works. Topics vary from semester to semester; see department announcement for description. (F,SP) Staff

249. Graduate Studies. (1) Course may be repeated for credit. Three hours of lecture per week. Prerequisite: Graduate standing in Scandinavian Studies. Reading of one or two of the following courses: Scandinavian C107, C108, 115, 116, 117, 120, or 165. Students attend lectures and do all written work in the main course and also read assignments in the Scandinavian languages and write a paper. (F,SP) Staff

250. Seminar in Scandinavian Literature. (4) Course may be repeated for credit. Three hours of seminar per week. Investigation of selected authors, topics, or problems. Variable subject matter; see department announcement for description. (F,SP) Staff

298. Special Study. (2-12) Course may be repeated for credit. Tutorial. Designed to explore a restricted field involving the writing of a report. May not be substituted for any other course. (F,SP) Staff

299. Dissertation Writing. (2-12) Course may be repeated for credit. Supervised study. Must be taken on a satisfactory/unsatisfactory basis. (F,SP) Staff

601. Individual Study for M.A. Candidates. (1-8) Course may be repeated for credit. Supervised study. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive or language requirements in consultation with the field adviser. Units may not be used to meet unit or residence requirements for the master's degree. (F,SP) Staff

602. Individual Study for Doctoral Candidates. (1-8) Course may be repeated for credit. Supervised study. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with the major field adviser to prepare qualified students for various examination requirements for the Ph.D. May not be used to meet unit or residence requirements for the doctoral degree. (F,SP) Staff

300A. Methods of Teaching Scandinavian Lan- guages. (3) Course may be repeated for credit. Three hours of seminar per week. Must be taken on a sat- isfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Course consists of a two-hour session per week that will examine current theory and practice of foreign language teaching in connection with Danish, Finnish, Norwegian, and Swedish. (F,SP) Staff

300B. Teaching Practicum. (1) Course may be repeated for credit. One hour of consultation per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student instructor in the Scandinavian department. Graduate student instructors must enroll in 300B each semester following the completion of 300A or the equivalent. The course consists of a one-hour weekly session devoted to the analysis and a discussion of pedagogical problems as they arise in the classroom. (F,SP) Staff

301. Scandinavian Teaching Methods. (3) Course is repeatable for credit equivalent of one semester of employment at a graduate student instructor (GSI). Three hours of individual or group consultation per week. Must be taken on a satisfactory/unsatisfactory basis. Course on practical teaching methods, grading, testing, class- room management, and assessment of learning in the Scandinavian languages and syllabi. Required of all Scandinavian department GSIs. (F,SP) Staff

Science and Mathematics Education (College of Letters and Science)

Group Office: 4533 Tolman Hall, (510) 642-4207
gse.berkeley.edu/program/SEMSE/semse.html

Faculty

Dor Abrahamson, Ph.D. Northwestern University. Mathematics cognition through the lenses of design-based frameworks. (Education/Natural Sciences, Engineering and Computer Sciences)

Alice M. Agogino, Ph.D. Stanford University. Artificial intelligence and expert systems, design theory and methods, engineering education. (Mechanical Engineering)

Marie D. Diamond, Ph.D. University of California, Berkeley. Neuropsychology, environment, asymmetry, hormones (Integrative Biology)

Andrea A. diSessa, Ph.D. Massachusetts Institute of Technology. Computers in education, instruction in physics and mathematics, learning and reasoning in science and mathematics (Education)

Rand Engle, Ph.D. Stanford University. Classroom discussions in science and mathematics (Education)

Bernard R. Gifford (Chairman of the Department), Ph.D. University of Rochester. Organizational theory, policy analysis, resource allocation policies, micro-implementation, fiscal stress management, technology and education

Marcia C. Linn, Ph.D. Stanford University. Scientific reasoning, cognition and technology, programming and problem solving, individual differences associated with gender (Education)

Carolyn Merchant, Ph.D. University of Wisconsin. Science and technology: historical and philosophical perspectives, cultural and social dimensions of gender (Environmental Science, Policy, and Management)

Michael R. Shaffer, Ph.D. University of Michigan. Problem solving, knowledge representation and reorganization, computational models of reasoning, intelligent tutoring systems (Education)

Alan H. Schoenfeld, Ph.D. University of California, Berkeley. Psychology of mathematical problem solving, metacognition, belief systems (Education/Mathematics)

Angela Sticca, Ph.D. Cornell University. Inorganic and Physical chemistry (Chemistry)

Barbara Y. White (Chair of the Department), Ph.D. Massachusetts Institute of Technology. All models of scientific and mathematical expertise, computer-based learning environments, metacognition, instructional design (Education/Computer Science)

Affiliated Members

M. Grace, Ph.D. Stanford University (Electrical Engineering and Computer Sciences)

Description of the Program

The Group in Science and Mathematics Education offers a graduate program designed to allow students to combine advanced training in one of the natural sciences, engineering/computer science, or mathematics with the preparation in one or more of the areas in the area of education. Students enrolled in the program will be expected to attain in their chosen scientific discipline a degree of competence comparable to that of a doctoral candidate in that discipline. Their thesis research will consist of a project dealing with the development of improved educational approaches, research on new instruc-
**Admission Requirements**

To enter the program, students must have an excellent academic record with a bachelor's or, preferably, a master's degree in a natural science, mathematics, or engineering/computer science. Experience teaching, developing instructional materials, completing a minor or major project, or psychological research in these areas will also be favorably considered. Knowledge of psychology, cognitive science, education, or statistics is helpful but not required.

More detailed information about the program and its requirements can be obtained from the group office.

**Graduate Courses**

**210. Practicum in Science and Math Education Research** (1-4) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. Two hours of meeting per week. Prerequisites: Consent of instructor. Practical experience on an educational research or development project on campus or elsewhere for 8-12 hours per week. Class meetings augment research experience with discussions of readings and interaction with guest speakers. (F, SP)

**220C. Instructional Design in Science and Mathematics Education** (3) Three hours of lecture/discussion per week. Prerequisites: 220B or consent of the instructor. Survey of literature on design of instruction in science and mathematics, including development of instructional models and development of instruction modules for topics in science and mathematics. (SP)

**292. Research Seminar and Colloquium** (1) Course may be repeated for credit. Two hours of lecture discussion per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Discussion of current education research carried on by students, faculty, and guest speakers. A written analysis of several presentations required. (F, SP)

**294. Formulation of Educational Research** (1-3) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. Individual conferences with instructor. Prerequisites: Consent of instructor. Development of thesis proposal under supervision of faculty member. (F, SP)

**295. Research** (1-12) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Independent research activities under supervision of a faculty member. (F, SP)

**299. Individual Reading and Study** (1-5) Course may be repeated for credit. 1 unit of credit for each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Individual reading and study under the supervision of a faculty member. (F, SP)

**602. Individual Study for Qualifying Examination** (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study, under the supervision of a faculty member, designed to prepare the student for Ph.D. qualifying examination. (F, SP)

**Slavic Languages and Literatures**

(College of Letters and Science)

**Department Office:** 6303 Dwinelle Hall, (510) 642-2979 slavic.berkeley.edu

**Professors**

Ronelle Alexander, Ph.D. Harvard University. South Slavic languages, literatures, linguistics, and folklore

David Frick, Ph.D. Yale University. Polish and pre-modern Slavic literatures and cultural history

Olga Matchev, Ph.D. University of California, Los Angeles. Russian literature and cultural history

Eric Naiman, Ph.D. University of California, Berkeley. Russian literature and culture

**Associate Professors**

Anne Nesbet, Ph.D. University of California, Berkeley. Russian literature and film

Harsha Ram, Ph.D. Yale University. Russian literature

**Assistant Professor**

Lyubov Golubt, Ph.D. Stanford University. Comparative literature, Russian literature and culture

**Lecturers**

Arkady Alexeev, Ph.D. University of California, Berkeley. Russian language, Slavic linguistics

Ellen Langer, Ph.D. University of California, Berkeley. Czech language, Slavic linguistics

Lisa Little, M.A. University of Texas, Austin. Russian language, language teaching methodology

Anna Muza, Ph.D. State Institute of Theater Arts (GITIS; currently Russian Academy of Performing Arts)

**Major Adviser:** Ms. Alexander

**Graduate Adviser:** Mr. Naiman

**Department Overview**

The Department of Slavic Languages and Literatures provides instruction in the languages and cultures of Russian and other Slavic peoples—Bulgarian, Czech, Polish, Romanian, and Bosnian, Croatian, Serbian (BCS)—as well as some of the non-Slavic peoples of Eastern Europe (Hungarian) and Eurasia (Armenian). In addition to language and literature, our department teaches different aspects of Slavic and non-Slavic cultures, including film, drama, and literature, our department teaches different aspects of Slavic and non-Slavic cultures, including film, drama, and literature.

**Majors.** The department offers three different major tracks. The major track in Russian/East European/Eurasian cultures offers an interdisciplinary "area studies" approach. For this major track, two years of study (or the equivalent) in Russian or another language are required. The major track in Russian language and literature focuses specifically on Russian language and literature. It requires three years of language coursework (or the equivalent). The major tracks in other Slavic languages and literatures allow students to focus intensively on Czech, Polish, or BCS (Bosnian, Croatian, Serbian).

**Minors.** The department offers a range of minors in Russian and other Slavic languages, literatures, and cultures. Students normally discuss the possibility of doing a minor with the faculty or staff major adviser well before graduation, although the Completion of L&S Minor form is completed with the major adviser in the student's final semester. Courses used to satisfy major and minor requirements must be taken for a letter grade.

**Slavic Languages and Literatures**

**292. Research Seminar and Colloquium.** (1) This course may be repeated for credit. One unit of credit for each four hours of student effort per week. Two hours of meet- 

**294. Formulation of Educational Research.** (1-3) This course may be repeated for credit. One unit of credit for each four hours of student effort per week. Individual conferences with instructor. Prerequisites: Consent of instructor. Development of thesis proposal under supervision of faculty member. (F, SP)

**295. Research.** (1-12) Course may be repeated for credit. One unit of credit for each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Discussion of current education research carried on by students, faculty, and guest speakers. A written analysis of several presentations required. (F, SP)

**299. Individual Reading and Study.** (1-5) Course may be repeated for credit. 1 unit of credit for each four hours of student effort per week. Individual conferences. Prerequisites: Consent of instructor. Individual reading and study under the supervision of a faculty member. (F, SP)

**602. Individual Study for Qualifying Examination.** (1-8) Course may be repeated for credit. Course does not satisfy unit or residence requirements. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Individual study, under the supervision of a faculty member, designed to prepare the student for Ph.D. qualifying examination. (F, SP)

**Major Track in Russian/East European/Eurasian Cultures (50-52 units)**

This major track integrates the study of languages and cultures of a large area: Russia, Eastern/Central Europe, and Eurasia. Students design their own programs by selecting courses offered by the Slavic department and other departments such as History, Sociology, Art, Political Science, Music, and Peace and Conflict Studies. While all majors in this track will gain some knowledge of the whole area, the program also allows each student to: (1) emphasize a specific cultural region, (2) compare different regions, or (3) define a specific field of study. Students are advised to see the major adviser in advance to prepare an individualized study list plan. Note: Students may declare the major upon entry to the university; however, we encourage one year of study in the student’s major language prior to declaration.

**Requirements**

**Lower Division (22-24 units):** (1) Four semesters of one language of the area (18 to 20 units) or the equivalent, as determined by examination. The department highly recommends additional exposure to language coursework. Intensive summer language programs, or the UC Education Abroad Program. Russian and East European heritage speakers: Visit the department website for language-placement approval instructions.

Languages offered by this department that can be used for the major are Russian, Polish, Czech, BCS (Bosnian, Croatian, Serbian), Bulgarian, Romanian, Hungarian, and Armenian. The following languages have been offered periodically in our department or other departments and may, by special arrangement, be used for this major track: Kazakh, Inugh, Chechen, Lithuanian, and others.

(2) One lower division course in the Slavic department: Slavic 50, Introduction to Russian, East European, and Eurasian Cultures. With permission of the major adviser, it may be possible to substitute another lower division course in the department relevant to the major, e.g., Slavic 39, 45, 46.

**Upper Division (28 units):** (1) One cultural topics course: Slavic 146, Topics in Russian Cultural History, or 158, Topics in East European and Eurasian Cultural History.

(2) One relevant course in the Department of History, e.g., History 171A, 171B, or 171C; 172; 175A; 177A or B.

(3) Five courses chosen from the upper division offerings of the Slavic department, and the following courses from outside departments: Anthropology, Art History, Comparative Literature, Economics, Journalism, Legal Studies, Peace and Conflict Studies, and Theater, Dance, and Performance Studies.

Up to three elective courses may be taken in departments other than Slavic.

Up to two upper-division language courses in the Slavic department, taken in addition to the initial four semesters of language, can be counted toward this requirement. Up to two lower or upper division courses in a second language relevant to the program of study can be counted toward these electives.
Major Track in Russian Language and Literature (53-56 units)

This major track integrates the study of Russian language, literature, institutions, and culture. Students will learn what defines Russia’s unique place in civilization, both in earlier times and in today’s world.

Requirements

Students may declare the major after completion of Slavic 2 and either Slavic 45 or 46.

Lower Division (26 units): (1) The first four semesters of Russian (Slavic 1, 2, 3, 4) or the equivalent. Russian heritage speakers: Visit the department website for language placement approval instructions. (2) Nineteenth- and 20th-century surveys of Russian literature (Slavic 45 and 46).

Upper Division (27-30 units): (1) Advanced Russian language (Slavic 103A, 103B) and conversation (Slavic 120A or 120B). (2) One literature course with readings in Russian (Slavic 180, 181, 182 or 188). (3) One Russian literature class in English translation (Slavic 131, 132, 133, 134A-B-C-D-E-F-G-N, or 146). (4) One course in culture selected from the following: Russian culture (Slavic 130, 131, 140, 146, 148, 190), or the literatures of other Slavic peoples (Slavic 150, 160, 170), folklore (Slavic 147A or 147B), linguistics (Slavic 137), or film (Slavic 138). (5) Two additional upper-division elective courses (3 or 4 units each) in Russian language, literature, or culture selected from the courses listed above. Relevant courses from other programs—or for example, history—may be substituted with the permission of the major adviser.

Honors Program

Slavic majors with a minimum GPA of 3.3 overall and in courses for the major are invited to consult with members of the faculty and the major adviser in the spring of their junior year about the Honors Program and a thesis topic. Requirements for the Honors Program in Slavic include: (1) an additional upper-division Slavic course chosen by the student, and (2) an honors thesis course (H195). In the honors thesis course, normally taken during the fall semester of the senior year, the student works under the direction of a member of the faculty (the thesis director). In order to enroll in H195, students must file an application with the department (available from the undergraduate student services adviser). This application includes a preliminary statement of the thesis topic and the names and signatures of the honors committee—the faculty director and one additional faculty member, who also read the completed thesis, and the department chair.

Minor Tracks

The department offers minors in: (a) Russian language; (b) Russian literature (requiring no knowledge of Russian); (c) Russian language, literature, and culture; and (d) Slavic languages/literatures with an emphasis in either Czech, Polish, or BCS (Bosnian, Croatian, Slovenian, or Serbian) language and literature.

Requirements. The basic course requirement for each of the minors is five upper division courses, all completed for a letter grade. Three of them must be completed at Berkeley. The minor is in a field academically distinct from the student’s major. An overall GPA of 2.0 in upper division courses applied to the minor program is required. Students must see the major adviser early on to formulate a study plan and complete the minor paperwork (Completion of L&S Minor form) is completed with the major adviser in the student’s final semester at Berkeley.

Restrictions to Minor Tracks. (1) Russian native speakers may choose only the minor in Russian literature; (2) Russian heritage speakers may choose any minor except the minor in Russian language; and (3) native or heritage speakers of an East European language may choose any minor that does not utilize their native/heritage language. Note: Native or heritage proficiency is determined by the major adviser in consultation with the relevant faculty language coordinator. Final approval for a minor resides with the major adviser.

Minor in Russian Language, Literature, and Culture

Prerequisites: Four semesters of elementary and intermediate Russian (Slavic 1, 2, 3, and 4, or equivalent). Russian heritage speakers: Visit the department website for language placement approval instructions.

Five upper division courses (3 or 4 units each) in Russian language and Russian or other Slavic literatures and cultures. Students may choose courses in any combination, in consultation with the major adviser. A course from another related field (for example, comparative literature) may be substituted with approval of the major adviser.

Total lower division units: 20
Total upper division units: 15-20

Minor in Russian Literature

Prerequisites: Four semesters of elementary/intermediate Russian (Slavic 1, 2, 3, and 4, or equivalent). Four semesters of advanced Russian: Slavic 103A-103B, plus two courses chosen from Slavic 104A, 104B, 180, 181, 182, 188, advanced Russian conversation: Slavic 120A or 120B.

Total lower division units: 20
Total upper division units: 16-20

Minor in Russian Literature. Prerequisites: Surveys of Russian literature (Slavic 45, 46).

One course on the culture of Russia or other Slavic nations (chosen from Slavic 130, 138, 140, 146, 147A, 147B, 148, 150, 160, 170).

Four courses in Russian literature (chosen from Slavic 120, 133, 134A-134B-134C-134D-134E-134F-134G-134H, 136, 140, 180, 181, 182, 188).

Total lower division units: 6
Total upper division units: 19-20

Minor in Czech, Polish, or BCS (Bosnian, Croatian, Serbian) Language and Literature

Prerequisites: Appropriate first-year language sequence: Slavic 25A-25B, 26A-26B, or 27A-27B, or equivalent. Note: Native and heritage speakers of an East European language may choose any minor that does not utilize their native language. Visit the department website for language placement approval instructions.


One course in the relevant literature survey: Slavic 150, 160, or 170.

Two courses in the relevant literature: Slavic 151 or 152 and 161 and 170, or any minor approved by the major adviser.

Total lower division units: 10
Total upper division units: 17-18

Education Abroad

The Department of Slavic Languages and Literature actively encourages students to participate in study abroad programs in Russia and other Slavic countries. Through the UC Education Abroad Program, students may spend a fall semester in St. Petersburg, which provides intensive work on Russian language, literature, and culture. There is also a program sometimes offered in Budapest featuring Central European studies. Other institutions also offer programs in Russia and other Slavic lands, both during the school year and summer. Please consult with the major adviser for information about these programs.

The Slavic National Honor Society and Department Events

The Berkeley Chapter of Dobro Slovo, the National Slavic Honor Society, is part of a nationwide honor society that recognizes outstanding achievement in Slavic studies. Students who meet the GPA and academic requirements are invited by the faculty undergraduate adviser to join during the spring semester of their senior year. Our campus hosts many Slavic-related lectures, concerts, films, conferences, and other events. A weekly Russian conversation hour is one of the department’s most lively institutions. The Polish Circle and Czech Circle meet regularly for discussions and social events. Film showings—of classic and contemporary films from Russia and other countries—are periodically organized by graduate students.

Admission to Graduate Study

The department offers a synthetic approach to the study of language, literature, and culture. The most common career choice of our graduates is teaching at the college level, although some also pursue careers in writing, publishing, public and government service, and other fields in the humanities. Applicants must have completed an undergraduate major program in Slavic languages and literatures or received equivalent training. Prospective and current students are encouraged to have a background in other related fields—for those in literary
studies, European languages and literatures (especially French, German, and English), literary theory, Russian and Western European intellectual history, and Slavic linguistics are recommended. Instruction in French, German, Greek, or Latin, and in general and comparative linguistics is desirable.

We select our graduate students on the basis of prior academic achievement and promise of success in scholarship and teaching. Students admitted to the Ph.D. program with an M.A. in Slavic or a related field from another institution are required to pass a screening (permission-to-proceed) examination. Students who have earned the M.A. degree from a program may receive permission to proceed to the Ph.D. program following successful performance on the M.A. comprehensive examinations and demonstrated aptitude for advanced work. The department does not accept applications for a terminal M.A. program of study.

Graduate Programs

Students are admitted to the Ph.D. or M.A./Ph.D. program with a focus in Russian, Polish, Bulgarian, and BCS (Bosnian, Croatian, Serbian), each with an emphasis in literature or linguistics. The department will not consider applications for an M.A. degree. Detailed descriptions of course requirements and examinations are available from the department website. Described below are programs focusing on Russian literature and on linguistics. Students who choose other Slavic literatures as their major field are offered individual programs of study.

M.A. Coursework. Russian Literature Program: (a) required skills and methods courses: Proseminar in literary scholarship, Old Church Slavic, Russian stylistics, descriptive grammar, proficiency maintenance; (b) selected courses in history and theory of literature to be chosen from topics that include late 18th-century literature, Slavic literary theory, sentimentalism and romanticism, realism, modernism, post-modernism, contemporary literature (office); (c) graduate research seminars (topics vary); at least one is required. Instruction in Polish, Czech, BCS (Bosnian, Croatian, Serbian), and Bulgarian is offered to both M.A. and Ph.D. students.

Linguistic Program: (a) required skills and methods courses: Proseminar in linguistic scholarship, Old Church Slavic, three semesters of a second Slavic language; and in the major language, stylistics, descriptive grammar, proficiency maintenance; (b) additional courses: Historical Grammar of Slavic Languages, Medieval Orthodox Slavic Texts, and, in the major language, stylistics; and (c) one period or genre literature course.

All candidates for the M.A. must demonstrate advanced proficiency in their major language, pass the department’s reading examination, and consent to proceed to the Ph.D. program following successful performance on the M.A. comprehensive examinations and demonstrated aptitude for advanced work. The department does not accept applications for a terminal M.A. program of study.

Ph.D. Requirements. Literature: The Ph.D. program in Russian literature consists of: (a) Additional coursework in literary history (including the medieval and early modern periods) and participation in research seminars and independent research. In addition, students develop knowledge of a second Slavic language and literature (Polish, Czech, Bulgarian, BCS; Bosnian, Croatian, Serbian), film, visual arts, music, comparative literature, minor field (e.g., film, Russian or East European history, Eurasian studies, etc.). (b) An extended written research project under faculty supervision and evaluation on a topic relative to the student’s field of study and interests. (c) Written and oral Ph.D. examinations. (d) A dissertation.

Linguistics: The Ph.D. program in Slavic linguistics consists of: (a) required courses covering core content of the major language(s); (b) additional courses covering advanced structure of Slavic languages, history of Slavic literary languages, and two semesters of a third Slavic language; (c) additional courses covering proficiency in phonetics—grammatical analysis and theory, structural and cultural history of a major language, and comparative philology; (d) an extended written research project with faculty supervision and evaluation; (e) written and oral Ph.D. examinations; and (f) a dissertation.

All candidates for the Ph.D. must pass a written and oral examination in their major Slavic language and demonstrate reading knowledge of at least two languages other than their major language (to be selected from French, German, and a second Slavic language).

Instruction in language-teaching methodology is provided for graduate student instructors and prospective teachers of Russian, Polish, Czech, and BCS (Bosnian, Croatian, Serbian). Internships (Slavic 310) are available in the teaching of literature or Slavic linguistics.

Czech

Lower Division Courses

26A-26B. Introductory Czech. (5,5) Five hours of lecture per week. Prerequisites: 26B is prerequisite to 26B. Beginner’s course. Sequence beginning fall. (F,SP) Langer, Staff

Upper Division Courses

116A-116B. Advanced Czech. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 116A is prerequisite to 116B. Sequence begins fall semester. (F,SP) Langer, Staff

160. Survey of Czech Literature. (3) Three hours of lecture per week. Outline history of Czech literature from the 10th century to the present, including medieval literature of the 14th century, the National Revival of the 19th century, and the modern period. Internships (Slavic 310) are available in the teaching of literature or Slavic linguistics.

Polish

Lower Division Courses

25A-25B. Introductory Polish. (5,5) Five hours of lecture per week. Prerequisites: 25A is prerequisite to 25B. Beginner’s course. Sequence beginning fall. (F,SP) Staff

Upper Division Courses

115A-115B. Advanced Polish. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 25B is prerequisite to 115A; 116B is prerequisite to 116B. Sequence begins fall semester. (F,SP) Frick

150. Polish Literature and Intellectual Trends. (3) Three hours of lecture per week. A survey of the major writers, works, and trends of the Polish literary tradition from the Middle Ages to the present. Special attention devoted to the Renaissance, the Age of Romanticism, and the modern period. No knowledge of Polish required. (F,SP) Frick

151. Readings in Polish Literature. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture/discussion per week. Prerequisites: 115A. Selected readings in Polish tailored to the academic interests of students enrolled. Frick

Russian Language

Lower Division Courses

1. Elementary Russian. (5) Five hours of lecture and two hours of language laboratory per week. Prerequisites: 1, 1A, or equivalent. (F,SP) Staff

2. Elementary Russian. (5) Five hours of lecture and two hours of language laboratory per week. Prerequisites: 1, 1A, or equivalent. (F,SP) Staff

3. Intermediate Russian. (5) Five hours of lecture and one hour of language laboratory per week. Prerequisites: 2, 1B, or equivalent. (F,SP) Staff

4. Intermediate Russian. (5) Five hours of lecture and one hour of language laboratory per week. (F,SP) Staff

6A-6B. Introductory Russian for Heritage Speakers. (3,3) Three hours of lecture per week. Prerequisites: Basic proficiency in Russian; placement test and consent of instructor. The course is aimed at “heritage speakers” of Russian, i.e., those who grew up speaking Russian in the family without a full Russian educational and cultural background. These courses are designed for students who have speaking and comprehension ability in Russian but have minimum exposure to writing and reading. This course teaches basic skills of writing, reading, and grammar. 6A focuses on basic writing and reading ability. 6B introduces further knowledge of grammar and develops writing skills. Both 6A and 6B include reading and cultural material. (Students with advanced reading proficiency should consider Slavic 114 or Slavic 190.) (F,SP) Staff

Upper Division Courses

101. Advanced Russian Phonetics and Oral Prac- ticising. (F,SP) Muza. May be repeated for credit. Three hours of lecture per week. Prerequisites: 4, 14D, or equivalent. Aimed at both undergraduate and graduate students, this course helps students to improve their pronunciation and brings it closer to the native level. The course teaches a whole spectrum of oral speech performance, including phonetics, intonation, and rhetoric, taking into account different functional styles. Course may be taken for 1 unit (five weeks: basic skills), 2 units (10 weeks: advanced skills) or 3 units (15 weeks: advanced phonetics and performance). (F,SP) Alexeev

103A-103B. Advanced Russian. (4,4) Four hours of lecture per week. Prerequisites: 4, 14D, or equivalent. The course covers the core course content of advanced Russian: grammar, syntax, and reading. Grammar is reviewed. Course taught in Russian. (F,SP) Alexeev

105A-105B. Advanced Russian/English/Russian Translation. (1-3,1-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 2, 3, 4, or equivalent, or consent of instructor. Advanced training in both oral and written translation skills covering various areas of politics, business, technology, law, science, and culture. Elements of literary and poetic translation. Course may be taken for 1 unit (five weeks: basic translation skills), 2 units (10 weeks: advanced skills), or 3 units (15 weeks: professional skills). (F,SP) Alexeev, Muza

106A-106B. Advanced Russian for Heritage Speak- ers. (3,3) Three hours of lecture per week. Prerequisites: Advanced speaking and reading proficiency in Russian, placement test, and consent of instructor. The course is aimed at “heritage speakers” of Russian, i.e., those who grew up speaking Russian in the family without a standard Russian educational background. The advanced course aims at building a sophisticated vocabulary, developing advanced reading ability, formal knowledge of grammar, and complete writing competency. This course fosters students’ knowledge and understanding of Russian culture and society today. (Students with no or rudimentary reading proficiency should consider 6A or 6B by consent of instructor.) (F,SP) Muza, Staff

109. Business Russian. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequi-
Russian Literature

Lower Division Courses

36. Great Books of Russian Literature. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly 39. Readings in English of representative texts from the Russian literary tradition. Variable topics. (F,SP) Paperno, Staff

114. Advanced Self-Paced Russian for Heritage Speakers. (1-6) Course may be repeated for a maximum of 6 units. Individual conferences. Prerequisites: Advanced Russian conversation and reading proficiency in Russian; placement test and consent of instructor. The course is aimed at "heritage speakers" of Russian, i.e., those who grew up speaking Russian in the family without formal education in Russian. Materials combined from major Russian and Western (English and American) 19th- and 20th-century novels, and their interrelations. Variable reading list. See Department announcement for description. (F,SP) Golburt, Staff

100. Russian Culture Taught in Russian: Country, Identity, and Language. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: Advanced Russian, at least three years of college level or equivalent with consent of instructor. Based on wide range of sources from the 19th and 20th centuries—works of fiction, publicities, personal documents—the course will trace the formation and historical transformation of Russian cultural identity, including issues in national identity, ethnicity, position in relation to state, gender, and sexuality. The class is aimed at students with advanced knowledge of Russian, both Americans studying Russian and Russians living in America. All readings, lectures, and discussions in Russian. (F,SP) Alexeev, Paperno, Staff

Graduate Courses

248. Topics in Russian Cultural History. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing or consent of instructor. This seminar addresses the problems and methods of cultural history within the Russian context. Special attention will be given to the social, political, and historical matrices which determine (and may be determined) by aesthetic production, as well as to the role of culture in the construction of everyday life. Topic and period variable. Instruction in English; texts in Russian. Students without reading knowledge of Russian should consult with instructor. (F,SP) Staff

298. Special Study for Graduate Students. (2-8) Course may be repeated for credit. Individual conferences. Preliminary exploration of a restricted field involving research and a written report. (F,SP) Staff

Bulgarian

Lower Division Courses

28A-28B. Introductory Bulgarian. (5-5) Five hours of lecture per week. Prerequisites: 28A is prerequisite for 28B, or consent of instructor. Sequence begins in the fall. Practical instruction in the Bulgarian language with a focus on integrated skills (reading, grammar, conversation). Course offered as staffing permits. (F,SP) Staff

Upper Division Courses

118A-118B. Advanced Bulgarian. (4,4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 28B is prerequisite to 118A, 118A is prerequisite to 118B, or consent of instructor.

A. This course consists of a review of Bulgarian grammar covered in 28A-28B, a thorough presentation of the complex verbal tense-mood-system and readings in contemporary Bulgarian prose.

B. This course is a continuation of 118A. It also introduces the question of the relation between Bulgarian and Macedonian and readings in Bulgarian belletristic poetry and prose. (F,SP) Alexander
to the present with the emphasis on cultural identity. Readings in history, fiction, folklore, viewing of films, and art works. Thematic units include formation of the Russian intelligentsia in the Romantic era, empire and identity in Eastern/Central Europe; Soviet and post-Soviet daily life, Jews in Slavic lands, the former Yugoslavia; multi-ethnic lands. Required of majors in Russian/East European/Eurasian cultures, the course is also aimed at a broad audience. Knowledge of the languages of the area is not required. (F,SP) Staff

98. Directed Group Study. (1-4) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Freshman or sophomore standing. Group study of selected topics not covered by regularly scheduled courses. (F,SP) Staff

99. Individual Study. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: 30 GPA. Supervised independent study for lower division students with a minimum 3.0 GPA. (F,SP) Staff

Upper Division Courses

C139. Language Spread. (3) Three hours of lecture per week. Linguistic background and the general principles of language spread. Mechanisms of language spread, including creolization-decreolization, language planning, and the role of bilingualism. Case studies in language spread, including Austronesian, Indo-European, American, Uralic, African, Sinitic, and Australian. The role of language spread to immigration and culture spreads. Also listed as Linguistics C139. Staff

140. The Performing Arts in Russia and Eastern Europe. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. The course will examine the Russian and East European contribution to the practice and theory of the performing arts, especially (but not exclusively) theater. The course emphasizes the involvement of the performing arts in the social and cultural fabric. (F,SP) Muza, Staff

147A. East Slavic Folklore. (3) Course may be repeated once for credit with consent of instructor. Three hours of lecture per week. Folktales, epic songs, customs, and beliefs of Russians and Ukrainians. (F,SP) Alexander

147B. Balkan Folklore. (3) Three hours of lecture per week. Folktales, epic songs, customs, and beliefs of the South Slavs and other Balkan peoples. (F,SP) Alexander

147R. Slavic Studies Research. (1) Individual consultation. Research project to be coordinated with lecture course 147. Supervised by the instructor of the lecture course in which the student is also enrolled. Final research paper of 10-15 pages required. (F,SP) Alexander

158. Topics in East European/Eurasian Cultural History. (4) Course may be repeated for credit. Three hours of lecture/discussion per week. This course examines various dimensions of different East European and Eurasian (Central Asia, the Caucasus, Siberia) cultures (history, society, languages, literature, art). Variable topics. Instruction and readings in English; students with knowledge of the languages of the area are encouraged to do some reading in the original language. (F,SP) Staff

H195. Honors Seminar. (4) Individual conferences. Prerequisites: Overall and major GPA of 3.3. Study and research on a topic selected by the student in consultation with the faculty adviser, to culminate in the writing of a thesis. See department description of the Honors Program. (F,SP) Staff

198. Supervised Group Study for Undergraduates. (1-4) Course may be repeated for credit. Variable. (Minimum of one meeting per week and individual consultation). Must be taken on a passed/not passed basis. Prerequisites: Students must have completed 60 units of undergraduate study and have a minimum GPA of 3.0. Supervised cooperative study of topics (in Slavic and East European languages and literatures). Prerequisites: must be covered by regularly scheduled courses. (F,SP) Staff

199. Supervised Independent Study and Research. (1-4) Course may be repeated for credit. Individual conferences. Must be taken on a passed/not passed basis. Prerequisites: Overall GPA of 3.0. (F,SP) Staff

Slavic

Graduate Courses

200. Graduate Colloquium. No credit. Must be taken on a satisfactory/unsatisfactory basis. Reports on current scholarly work by faculty and graduate students. (F,SP) Staff

201. Advanced Russian Proficiency Maintenance. (2-3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Graduate standing; 103B or equivalent; consent of instructor. Advanced work in speaking, writing and comprehension in order to develop and maintain superior proficiency. Discussions and readings will focus on current cultural and political trends and other topics pertaining to Slavic studies. Special attention to the details of contemporary life in Russia and its changing colloquial speech. Conducted in Russian. (F,SP) Staff

204. Russian Composition and Style. (4) Three hours of lecture per week. Prerequisites: 103B. Essay, writing, analysis of texts, oral and written reports, and translation. (F) Staff

210. Old Church Slavic. (4) Three hours of lecture per week. Prerequisites: Reading knowledge of a modern Slav language; consent of instructor. Introduction to Old Church Slavic, with special attention to inflexional morphology. Assigned translations and sight reading of selected texts. (SP) Frick, Staff

214. Medieval Orthodox Slavic Texts. (4) Three hours of lecture/discussion per week. Prerequisites: 230. Essay, writing, analysis of texts, oral and written reports, and translation. (F) Staff

220. Comparative Slavic Linguistics. (4) Three hours of lecture per week. Prerequisites: 210. Reconstruction of Common Slavic phonology and morphology in relation to Indo-European and modern Slavic languages. (F) Staff

222. Descriptive Grammar of Slavic Languages. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Knowledge of the language for which the instructor is responsible, and knowledge of contemporary Slavic language (Czech, Polish, Russian, or Serbian/Croatian); see department announcement for topic. Recommended for prospective teachers. (SP) Staff

223. Advanced Structure of Slavic Languages: Grammatical Analysis and Theory. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 222. Analysis of synchronic grammar and structure of a discourse of a Slavic language (Czech, Polish, Russian, Serbian or Croatian); some coverage of dialectology. See department announcement for topic. (F) Staff

230. Historical Grammar of Slavic Languages. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 210. Historical phonology, morphology, and syntax of a Slavic language (Czech, Polish, Russian, or Serbian/Croatian). Some coverage of dialectology. See department announcement for topic. (F) Staff

231. History of Slavic Literary Languages. (4) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Advanced knowledge of the modern language, 210; and at least one advanced or graduate-level literature course. Analysis of language and style of a Slavic literary language (Czech, Polish, Russian, or Serbian/Croatian) from the
beginnings to the present, with emphasis on periods of particular significance. See department announcement for topic. Staff

234. South Slavic Linguistics. (4) Three hours of lecture per week. Prerequisites: 220. Linguistic history and dialectology of Slovenian, Bulgarian, Macedonian, and Serbian/Croatian. (F,SP) Alexander

239. Twentieth-Century Slavic Literary Theory. (4) Three hours of lecture/discussion per week. Prerequisites: 281, 282, 221; one of: 245, 246, 287; approval of instructor. Attempts to describe literary forms, poetic usage of language, and cultural infrastructure, as a code, examined as a consistent trend in 20th-century literary theory. Consideration of this scholarly trend in historical perspective: its sources, evolution, and eventual disipation. (SP) Staff

242. Eighteenth-Century Russian Literature. (4) Three hours of lecture per week. Studies in poetry, drama, and fiction, covering major figures between 1730 and the end of the century. (F) Zhivov, Staff

243. The Russian Novel and Literatures of Western Europe. (4) Three hours of lecture per week. The development of the 19th-century Russian novel and its sources in and links with Western literary works and movements. (F,SP) Staff

245A. Russian Sentimentalism and Romanticism (1790s-1840s). (4) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor; adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. (F,SP) Staff

245B. Russian Realism (1840s-1900). (4) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor; adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. (F) Staff

245A. Russian Modernism (1890s-1920s). (4) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor; adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. (SP) Staff

246B. Contemporary Russian Literature (1920-Prepresent). (4) Three hours of lecture per week. Prerequisites: Graduate standing or consent of instructor; adequate knowledge of Russian. Coverage of major movements and genres in the intellectual context of the times. Readings in Russian. (F) Staff

258. Languages, Peoples, and Cultures of the Greater Slavic World. (4) Three hours of lecture per week. Prerequisites: Graduate standing; knowledge of target languages; consent of instructor. Topics in the languages, peoples, and cultures of Eastern and Central Europe, the CIS, and diasporas. Topics vary by region (e.g., Northeastern Europe, the Baltic Coast, the Caucasus) and approach (e.g., sociolinguistics, ethniclinguistics, studies of ethnic and language minorities). Readings include sources in the original languages of the area. (F,SP) Staff

260. Studies in Slavic Literature and Linguistics. (4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Graduate standing, consent of instructor. Advanced studies in the various fields of Slavic literatures and linguistics. Content varies. (F,SP) Staff

279. Proseminar: Aims and Methods of Literary Scholarship. (4) Three hours of seminar per week. Course designed for new graduate students in Slavic linguistics, the survey of general and Slavic linguistics, a Slavic philology, semantics, and the relation of linguistics to literary studies. Methods of research and critical analysis. Current issues and goals of research. (F) Staff

280. Proseminar: Aims and Methods of Linguistic Scholarship. (4) Three hours of seminar per week. Course designed for new graduate students in Slavic linguistics, the survey of general and Slavic linguistics, a Slavic philology, semantics, and the relation of linguistics to literary studies. Methods of research and critical analysis. Current issues and goals of research. (F) Staff

281. Russian Poetry. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Open to qualified undergraduates. Class conducted in Russian. Russian poetry and versification (18th, 19th and 20th centuries): close readings of texts. Variable topics. (F,SP) Staff

282. Proseminar: Aims and Methods of Linguistic Scholarship. (4) Three hours of seminar per week. Course designed for new graduate students in Slavic linguistics, the survey of general and Slavic linguistics, a Slavic philology, semantics, and the relation of linguistics to literary studies. Methods of research and critical analysis. Current issues and goals of research. (F) Staff

283. Eastern Christianity: History and Thought. (4) Three hours of lecture per week. Prerequisites: 240, 261, 262, 287. A survey of the religious thought and history of Eastern Europe and the Levant with an intent of providing greater insight into the shaping of faith and cultures of both halves of Europe. (F) Zhivov, Staff

287. Russian Poetry. (4) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: Open to qualified undergraduates. Class conducted in Russian. Russian poetry and versification (18th, 19th and 20th centuries): close readings of texts. Variable topics. (F,SP) Staff

288. Special Study for Graduate Students. (2-8) Course may be repeated for credit. Individual conferences. Preliminary exploration of a restricted field involving research and a written report. (F,SP) Staff

299. Directed Research. (2-12) Course may be repeated for credit. Individual conferences. Staff

601. Individual Study for Master's Students. (2-8) Course may be repeated for a maximum of 16 hours. Course does not satisfy unit or residence requirements for a master's degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study for the comprehensive or language reading examinations in consultation with a field adviser. (F,SP) Staff

602. Individual Study for Doctoral Students. (2-8) Course may be repeated for a maximum of 16 units. Course does not satisfy unit or residence requirements for doctoral degree. Individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Individual study in consultation with a major field adviser, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D. (F,SP) Staff

Professional Courses

301. Slavic Teaching Methods. (3) Course to be repeated for credit each semester of employment as graduate student instructor. Group and individual conferences. Must be taken on a satisfactory/unsatisfactory basis. Course on practical teaching methods, grading, testing, and design of supplementary course materials. Required of all graduate student instructors in Slavic. (F,SP) Staff

310. Internship in the Teaching of Literature/Linguistics. (1-2) Course may be repeated for credit. One two-hour conference per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Weekly meetings with the instructor of the designated course. Discussion of course aims, syllabus preparation, lecture and assignment planning, grading, and related matters. Students may prepare a representative portion of the work for such a course (e.g., lecture outline and assignments for a course segment) and may participate in presentation of the material and in evaluation of samples of student work. (F,SP) Staff

East European Studies

Lower Division Courses

1A-1B. Introductory Hungarian. (3,4,3) Three hours of lecture per week plus lab. Prerequisites: 1A is prerequisite to 1B; consent of instructor. Practical instruction in the Hungarian language. The course can be taken for either 3 or 4 units; the additional unit involves larger group work and additional written reading assignments. (F,SP) Staff

2A-2B. Introductory Romanian. (3,3) Three hours of lecture per week. Prerequisites: None. 2A: 2B is prerequisite to 2B or consent of instructor. The course will focus on reading and comprehension, elementary speaking and writing, and providing fundamental grammatical and lexical competence for further language acquisition in Romanian. (F,SP) Staff

Upper Division Courses

100. Readings in Hungarian. (2) Course may be repeated for credit. Two hours of lecture/discussion per week. Prerequisites: 1B or equivalent. (F,SP) Staff

102A-102B. Continuing Romanian. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 2B is prerequisite to 102A, or consent of instructor. 102A is prerequisite to 102B, or consent of instructor. The purpose of this course is to further develop students’ Romanian proficiency in all four language skills, including discussion, oral presentations, written assignments, and a variety of readings (literature, nonfiction, folklore, newspaper articles, etc.) chosen partly for their cultural significance and partly based on student needs and interests. Emphasis on particular skills (e.g., reading) depending on student needs and interests. (F,SP) Staff

Eurasian Studies

Lower Division Courses

1A-1B. Beginning Armenian. (3,3) Three hours of session per week. Prerequisites: 1A: None. 1B: 1A or equivalent; consent of instructor. Introduction to Armenian language and culture, aiming to give students basic competence in all four skills and an introduction to traditional and contemporary Armenian culture. (F,SP) Staff

99. Individual Study. (3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Three hours of tutorial per week. Must be taken on a passed/not passed basis. Prerequisites: Freshman or sophomore standing. Overall GPA of 3.0. Individual conferences. (F,SP) Staff

Upper Division Courses

199. Supervised Independent Study for Undergraduates. (3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Independent conferences. Must be taken on a passed/not passed basis. Prerequisites: Overall GPA of 3.0. (F,SP) Staff

Graduate Courses

298. Special Study for Graduate Students. (3) Course may be repeated for credit. Individual conferences. Prerequisites: Graduate standing and consent of instructor. Preliminary exploration of a restricted field involving research and written report. (F,SP) Staff
Social Welfare
(School of Social Welfare)

School of Social Welfare Office: 120 Haviland Hall, (510) 642-4431
socialwelfare.berkeley.edu
Dean: Lorraine Midanik, Ph.D.
Associate Dean: Rachel Liberman, Ph.D.
Director of Field Work: Greg Merrill, L.C.S.W.
Coordinator of Academic Programs: John Beatty, M.S.S.W.

Undergraduate Program, College of Letters and Science

Undergraduate Program
The School of Social Welfare is a graduate professional school dedicated to educating social workers and social welfare scholars for a range of leadership, research, teaching, and advanced practice roles in the profession. Our educational emphasis is on preparing students for professional responsibility in the field of social welfare and the institutional systems that comprise it, particularly public social services and publicly supported voluntary social services.

While students are prepared to practice at specific intervention levels and with specialized skills, all with an emphasis in knowledge and application of social and psychological issues, social welfare policies, and social service organizations. Master's-level professional education at Berkeley is characterized by a spirit of critical inquiry and an emphasis on the use of tested knowledge and theory in developing and applying intervention methods. Classroom preparation focuses on knowledge of individual and family development, ethnocultural factors, policies and institutional systems governing services, and research strategies for program development and education.

One aspect of Berkeley's mission is to educate students from groups that historically have been underrepresented in social work, because age, socioeconomic background, disability, geography, or discrimination. Students and faculty are committed to addressing demographic changes in California and the nation in order to advance the values and goals of the social work profession. These include recognizing the worth, uniqueness, and dignity of all individuals, fostering and strengthening the family and other systems of support, respecting cultural diversity, and promoting opportunity and social and economic justice for all.

The school offers the following programs:

Master of Social Welfare (M.S.W.). A two-year program of study for the Master of Social Welfare (M.S.W.) degree prepares students for advanced practice in social work. Classroom and field courses are designed to teach professionals to use tested knowledge and skill and research methods in their practice. Applicants for admission must have strong academic preparation in the liberal arts and sciences, including coursework in the social and behavioral sciences. In addition, introductory coursework in social work, research methods, and quantitative reasoning is given special attention. Knowledge of the social welfare field and professional commitment to social work are also evaluated. Such knowledge and commitment are usually demonstrated in part by successful paid employment related to social welfare. Paid experience, however, is not a requirement for admission; those who demonstrate sufficient commitment through voluntary experience may also qualify.

The M.S.W. program is accredited by the Council on Social Work Education.

Combined program, master-doctoral studies. Also offered is a combined program of master-doctoral studies that begins in the first graduate year and leads to both the Master of Social Welfare and the Ph.D. in social welfare degrees. Applicants must show evidence of their ability to complete doctoral study successfully and must have undergraduate preparation sufficient for the M.S.W. program.

Special programs. The School sponsors several special programs: the M.S.W./M.P.H. Dual and Concurrent Degree Programs, the Social Welfare/International and Global Studies Dual Degree Program, the Social Welfare/Law Concurrent Degree Program, the Pupil Personnel Services Credential Program, and the Title IV-E Child Welfare Training Program.

The Ph.D. in Social Welfare. The Ph.D. in social welfare prepares students for careers in teaching, research, policy development and analysis, and administration in the field of social welfare and the profession of social work. It is open to applicants who hold a master's degree in social work or social welfare or have comparable preparation in a closely related field and who show evidence of intellectual and other qualifications essential to successful doctoral study.

Applications. Applications for admission to any of these programs should be submitted as early as possible beginning in September and no later than December 1 for the Ph.D., M.S.W./Ph.D., and M.S.W./M.P.H., and January 5 for the M.S.W. for fall admission. Admission to the Ph.D. is contingent on admission to graduate standing. For more information, visit grad.berkeley.edu/admissions/index.shtml. Visit our website at socialwelfare.berkeley.edu or contact our Admissions Office for more information.

Lower Division Courses

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Enrollment is limited to 15 freshmen. (F,SP)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; departments may assign students to department and from semester to semester. (F,SP)
97. Field Studies in Social Welfare. (1-3) Field work in community agencies and individual conferences with faculty. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of social welfare in off-campus nonprofit and governmental organizations. (F,SP) Staff

98. Group Study in Social Welfare. (1-3) Course may be repeated for credit. Must be taken on a passed/not passed basis. Group study on selected social welfare topics. Open to freshmen and sophomores. (F,SP) Staff

Upper Division Courses

107. Foundations, Philanthropy, and the Social Services: Grant Writing for Program Development. (3) Two hours of lecture/discussion and service learning per week. Course explores the role of philanthropy, fundraising and social development in American society. A grant writing exercise in a Bay Area community agency is required. (F,SP) Staff

110. Social Work as a Profession. (3) Two hours of lecture and one hour of discussion per week. Formerly 102. This course examines social work as a profession: the practice of the profession, the organizational context of professional practice, and the ethics of the profession. (F,SP) Staff

112. Social Welfare Policy. (3) Two hours of lecture and one hour of discussion per week. Formerly 100. Analysis of policies and programs including public assistance, social insurance, social services, and health and mental health. (F,SP) Staff

114. Practice in Social Work. (3) Two hours of lecture and one hour of laboratory/discussion per week. Formerly 103. An introduction to the basic skills of interpersonal helping and problem solving and to related theory and research. (F,SP) Staff

116. Current Topics in Social Welfare. (2) Course may be repeated for credit with consent of instructor. Two hours of lecture per week. Prerequisites: 102. Formerly 105. Course examines current problems and issues in the field of social welfare. (F,SP) Staff

C129. Perspectives on the Young Child in Society. (3) Two hours of lecture and one hour of discussion per week. Prerequisites: 110 (Social Welfare majors). Formerly C116C. This course provides a multidisciplinary perspective on the development needs of children from birth to age five in the context of the varied social institutions in which they are cared for and educated. Specific attention will be focused on age-appropriate experiences within and beyond their families vary by social class, ethnicity and language, family needs and preferences, and special needs. Students will examine how expectations about the young child change as they age and how the child will become familiar with current and past policies debates about the education and social well-being of young children. Also listed as Education C116A and Psychology C104. Staff

186. Domestic Violence. (2) Two hours of lecture per week. This course will investigate the phenomenon of domestic violence in the United States from historical, psychological, sociological, anthropological, legal, feminist, and cross-cultural perspectives. We will study the impact this social problem has on families, relevant theories of causation, the merits of related services and interventions, and the experiences of diverse populations. (F,SP) Merrill

H195. Senior Honors Course. (1-3) Course may be repeated for credit. Individual consultation. Pre-requisites: 100. Preparation of an honors thesis. (F,SP) Staff

197. Field Studies in Social Welfare. (1-3) Field work in community agencies and individual conferences with faculty. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of social welfare in off-campus organizations. Regular individual meetings with faculty sponsor and written reports required. (F,SP) Staff

198. Group Study for Advanced Undergraduates. (1-3) Course may be repeated for credit. Lecture and discussion. Must be taken on a passed/not passed basis. Group study on selected social welfare topics. (F,SP) Staff

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. One to three hours of independent study per week. Must be chosen from among the approved passed basis. Enrollment is restricted by regulations specified in this catalog. (F,SP) Staff

Graduate Courses

200. Human Behavior and the Social Environment. (2) Two hours of lecture per week. The psychological, interpersonal, and social development of the person across the life span in the context of different social environments. (F) Stone

205. Psychosocial Problems and Psychopathology. (2) Two hours of lecture per week. Developmental abnormalities and deviations which result in dysfunctional behavior in the individual. Examines problems and disorders of children and adults from psychological and social perspectives. (F) Gambrell, Organista, Taubman

210A. Stress and Coping in Adulthood. (2) Two hours of lecture per week. Prerequisites: 200. Descriptions, measurements, and major theories concerning the etiology of stress and coping in the adult (25-60) years. Organista

210B. Infant Development. (2) Two hours of lecture per week. Prerequisites: 200. Topics and issues in infant development, including infant mental health, parent-child relationships, behavior assessment, predictors of disturbance, and intervention with high risk infants. (SP) Ivins

210C. Aging Processes. (2) Two hours of lecture per week. Sociological, psychological, physiological, and cultural factors relevant to understanding the complexity of the aging process. Normal and mal-adaptive aspects of the aging process are examined in terms of their implications for personal and societal adaptation. Scharlach

210D. Life Histories and Case Studies. (2) Two hours of lecture per week. Prerequisites: 200. Theoretical and methodological problems in the study of individual lives. Focus on the intellectual and social processes involved in the formulation, critical examination, and resolution of clinical case studies and psychobiographies. Staff

210F. Social Networks and Social Support. (2) Two hours of lecture per week. Prerequisites: 200. Focus on the "personal community"—those significant others available to render assistance in times of need. How people's social networks operate; their accomplishments and limitations; the role and skills of professionals in assessing and utilizing networks for clients. Staff

C210H. Perspectives in Personality: Personality Theory. (2) Two hours of seminar per week. Major approaches to personality theory, including psychoanalytic, behavioral, psychometric, and humanistic theory as well as work in culture and personality, the study of lives, and feminist psychology. Analysis of relations between the life, work, and social-historical context of Freud, Skinner, Rogers, Eysenck, Margaret Mead, and others, with attention to the origins, course, and (on occasion) fall of each tradition. Also listed as Psychology 347D. (F) Austin

210L. Group, Organizational, and Community Dynamics. (2) Two hours of lecture/discussion per week. Course examines theories of group, organization, and community dynamics. Topics include group leadership and decision making, organizational goals, structure, and change, and community power, and demographics. (F) Austin

220. Introduction to Social Welfare Policy. (2) Two hours of lecture per week. Analysis of issues in social welfare policy and recent trends shaping the development of the field. (F) Staff

222. Mental Health and Social Policy. (2) Two hours of lecture per week. Mental health policies and programs at the national, state, and local levels; major factors influencing the provision of mental health services; reciprocal relationships between mental health policy and social work practice. (SP) Segal

223. Advanced Seminar in Community Mental Health. (2) Two hours of seminar per week. Pre-requisites: 222. Seminar examines critical issues and practice affecting the mental health field. (F) Segal

226. Social Policy and Gerontology. (2) Two hours of lecture per week. U.S. social policy and programs for the aging are analyzed with respect to the knowledge required to assess the needs for societal support and major issues and trends in the delivery of social services. (SP) Robinson

230. Social Policy: Children and Families. (2) Two hours of lecture per week. Introduction to current problems, programs, and policies in child, youth, and family welfare. (F) Herrick

232. Social Work and Education Policy. (2) Two hours of lecture/discussion per week. This course examines the intersection between social work practice and the educational system. It focuses on the school as a social system and the current policy context of education. It presents current topics in educational policy and critically analyzes them from a social work perspective. A focus is placed on the potential roles played not only by school social workers but the social work profession as a whole, in collaboratively educating teachers in social work. (SP) Robinson

234A. Law and Social Welfare: Children and Families. (2) Two hours of lecture per week. Legal information and policy discussion related to social workers and other human service providers in the child and family welfare field. Staff

234B. Law and Social Welfare: Health and Mental Health. (2) Two hours of lecture/discussion per week. Addresses major legal issues related to aging and mental health encountered by social workers. Topics include reproductive rights, AIDS, right to treatment. Staff

234C. Legal and Ethical Issues in Aging. (2) Two hours of lecture/discussion per week. Course focuses on legal and ethical issues related to aging and long-term care, and their resolution. Issues covered include end-of-life decisions making; health care rationing; paternalism and self-determination; competency determines; mandated family responsibility; age versus need as a criterion for service eligibility. Staff

235. Homelessness in America. (2) Two hours of lecture/discussion per week. This course addresses homelessness in the context of social responsibility for the poor. It considers the legal, social, and psychological dimensions of homelessness and the diversity of the homeless, their special needs, handicaps, and behaviors; and assesses newly institutionalized systems of care and treatment. The course looks at homelessness as a full-time job of survival and explores the prospects of the homeless for changing their condition. (F) Segal

236. International Social Welfare. (2) Two hours of seminar/discussion per week. This seminar explores key international social welfare issues from the perspective of the global economic, social, and political environments. Although its primary focus is on social policies and social services, attention will also be given to the role of professional social work in the international context. While emphasizing theoretical and analytical issues, and political matters with particular reference to social work and social development will also be discussed. Students will have the opportunity to acquire both international social welfare activities as well as the analytical skills to address and debate complex international issues. (F,SP) Midgley

237. The Benevolent Asylum. (2) Two hours of lecture/discussion per week. Supervised residential care placement for a variable length of time over the summer. Intensive exposure and research and reflections on major issues of social welfare. The summer experience is intended to provide a base for understanding the issues that often are maligned during the last 50 years. Yet, for many, residential placement has served as a source of stability and quality care. This course will consider the history of residential care provision and development, finance,
ing, and design issues, including group responses to various aspects of the residential environment such as size, architecture, community access, supervision, etc. Using an approach that provides residen-
tial care, the course will consider setting objectives, special population needs, and person-environment fit. This course will look at the pros and cons of group, institutional care from a client-centered and from an empirical perspective. It will involve substantial use of international materials. The course will consider the theory and practice of residential care for a broad range of populations. It will provide the essentials necessary to enable students to develop and design benevolent asylums. (F,SP) Segal

238C. Health Policy—A Social Welfare Perspec-
tive. (2) Two hours of lecture per week. Reviews major issues and theories in the health care field. Course considers the social context of health care. Focus on the role of the public, voluntary, and private sectors, and the implications of policies and programs for society and the individuals affected. (F,B) Shapiro

238D. Women’s Issues in a Changing Society. (2) Two hours of lecture/discussion per week. This course addresses contemporary social issues that confront women in their personal and professional lives, including reproductive issues, domestic and workplace violence, and work and family. We examine these issues from an interdisciplinary perspective, drawing from law, history, psychology, and other social sciences. Staff

240. Introduction to the Field of Social Welfare and the Profession of Social Work. (2) Two hours of lecture per week. Course examines the history, development, and mission of the field and profession, fundamental social work tasks, and the organizational contexts of practice. (F) Grossman

241. Foundations of Social Work Practice. (3) Three hours of seminar/discussion per week. This course is designed to introduce generalist skills and knowl-
edge for social work practice with individuals, families, groups, organizations, and communities, within a framework of social work’s core values and funda-
mental principles. These core values include social justice and client empowerment. A gen-
eralist approach to understanding fundamental prac-
tice responsibilities includes cultural responsiveness, commitment to the social welfare mission, and the demonstration of practice effectiveness. (F)

243. Direct Practice in Child and Family Settings. (2) Two hours of lecture/discussion per week. Prereq-
quisites: 241. Direct intervention models for addressing the behavioral, emotional, and situational problems of children in child welfare, mental health, the behavioral, emotional, and situational problems. (SP) Scharlach

246. Direct Practice in Aging Settings. (2) Two hours of lecture/discussion per week. Prerequi-
tes: 241. Clinical case management with older adults. Comprehensive multidimensional assessments. It will provide the essential skills necessary to enable students to develop and design interventions to meet the needs of older adults and their families. (SP) Scharlach

250A. Social Work with Groups. (2) Two hours of lecture per week. Prerequisites: 241. Theory and prac-
tice regarding the formation, sustenance, and term-
nation of groups. Emphasis on the role of the social worker in facilitating interpersonal processes in groups. Edwards

250B. Family Therapy. (2) Two hours of lecture per week. Prerequisites: 241. Theoretical frameworks and intervention skills for family work. Staff

250C. Brief Therapy and Crisis Intervention. (2) Two hours of lecture per week. Prerequisites: 241. Examines the clinical application of crisis intervention and brief psychotherapy from an historic and psychodynamic perspective. Provides assessment crite-
ria for assignment to these forms of treatment and techniques for intervention. (SP) Herrera

250G. Psychodynamically Oriented Social Work Practice with Adults. (2) Two hours of lecture/disc-
cussion per week. Prerequisites: 241. This course examines clinical skills for working with adult clients from a psychodynamic perspective. Key concepts and pro-
cesses—such as the formation of a therapeutic alli-
ance, the client’s resistance, and the development and intervention strategies—of therapy are discussed and illustrated with case vignettes. Staff

250J. Social Work with Latino Populations. (2) Two hours of lecture/discussion per week. Prerequi-

250K. Social Work and Disability. (2) Two hours of lecture/discussion per week. Using a theoretical frame-
work grounded in the values of self-determination, dignity, and respect, this course will address issues in the disabilities field including demographics, etiology, policy and programs, and the disability resources network. Practice skills in communications, assess-
ment, and micro- and macro-level intervention will be reviewed. Staff

250L. Human Sexuality. (2) Two hours of lecture per week. This course will provide a forum for the explo-
raration of contemporary issues in human sexuality and the diversity of sexual experience, including the human sexual response cycle; childhood and ado-
lescent sexuality; sexual abuse; sexual orientation; and corresponding interventions—some attention will be directed to sexual diversity. Students must possess a working knowledge of DSM-IV-TR. (SP) Ayasse

250M. Death and Dying. (2) Two hours of lecture/seminar per week. This course explores death and dying from a variety of perspectives: psychologi-
cal, philosophical, cultural, spiritual, and phenomeno-
onological. Emphasis is on understanding the experiences of dying persons and their loved ones, as well as the interplay between the process of dying and the process of living. Implications for social work intervention will be discussed. (SP) Ayasse

250NA. Public Child Welfare Services. (1) Two hours of lecture every week. Prerequisites: 241. First part of a two-semester course designed for students preparing for careers in public child welfare. Students will survey the examination of norms, common clinical case management themes, impact of chemical dependency, and domestic violence screening and intervention models, and the practice of social work within the legal context of the dependency court. (SP) Raph

250NB. Public Child Welfare Services. (1) Two hours of lecture/seminar every week. Prerequisites: 241, 249A. Second part of the course designed for students preparing for careers in public child welfare. Spring term addresses the range of doc-
umentation required for legal purposes, practice issues for workers within the field setting, and skills required in presenting testimony. (SP) Raph

250P. Child Psychopathology: Issues in Assess-
ment and Treatment. (2) Two hours of seminar per week. Prerequisites: 245, 241. Course surveys assess-
ment and empirically based treatment approaches to various psychosocial problems in childhood and ado-
lescence. Specific emphasis is placed on internalizing and externalizing disorders. Course is taught using a development psychopathological framework. Students must possess a working knowledge of DSM-IV-TR. (SP) Staff

250Q. Strengthening Intergenerational/Intercul-
tural Ties in Immigrant Families. (2) Two hours of lecture/discussion per week. Prerequisites: 241, 249A. The United States is a nation of immigrants, with every American being the descendant of every nine Americans and one of every four Californians is an immigrant. Social workers need to acquire skills to serve this population. One specific problem that faces immigrant families is the development of intergenerational and intercultural conflict that occurs as a result of the differential acculturation between parents and their children. This course will be presented by immigrant families, and research has demonstrated that this conflict results in poor mental health for both par-
tents and children. Strengthening intergenerational/ intercultural ties in immigrant families (SITIF) is one of the very few empirically demonstrated interventions that exist to ameliorate this problem. This 10-week, 24-hour intervention is intended for use with immi-
grants from any ethnic background and may be admin-
istered in either a group or individual format. The course trains students to use SITIF effectively in their work with immigrant families. (F,SP) Staff

250T. Social Work Practice in School Settings. (2) Two hours of lecture/seminar per week. Prerequisites: 241, 249A. This course: (1) provides students with an under-
standing of how current educational policies and prac-
tices impact the day-to-day lives of academically and socially vulnerable students; (2) builds student skills in identifying and selecting the multiple points of inter-
vention relevant to social work in schools, including individual intervention with children, family intervention, building links between families and school staff, advocacy, classroom-based intervention, and collaboration with teachers; and (3) presents assessment and intervention strategies guided by an ecosys-
temic and resilience perspective which focus on student and family strengths and suggests multiple intervention options. (SP) Ayasse

250U. Substance Abuse Treatment. (2) Two hours of lecture per week. Prerequisites: 241. Course pro-
vides an introductory overview of various theories and methodologies currently used in the diagnosis and treatment of substance abuse. The bulk of the course will be devoted to the disease model and corresponding interventions, some attention will be given to prevention and epidemiology. Emphasis will be placed on the unique practice role of social work in the prevention/intervention of substance abuse problems. Mancellos

250X. Domestic Violence: Assessment and Inter-
vention. (2) Two hours of lecture per week. This prac-
tice-oriented course will teach graduate-level social work students to engage with domestic violence survivors and intervene effectively with individuals, families, and children impacted by intimate partner violence. We will review the scope, impact, and causes of the problem; relevant screening and assessment skills; effective clinical
intervention paradigms and techniques for victims, perpetrators, and children; and future directions. Significant time will be devoted to examining this problem in the context of current and recent interpersonal and international events. The course is designed for students with research interests in social welfare, health, and mental health service systems. Focus on health care, mental health, and services for children and families. Snowden

274. Immigrants and Refugees in the United States. (2) Two hours of seminar per week. Overview of immigration policy in the United States from an interdisciplinary perspective. To include the history of immigration, transnationalism, and adaptation will be addressed, along with skills required for working with refugees and immigrants facing difficulties. Addresses the immigration of refugees and newcomers to the United States and the circumstances newcomers and their families face once here. (SP) Chow

275. Diversity-Sensitive and Competent Social Work. (2) Two hours of lecture/discussion per week. Course prepares students to understand, provide, and evaluate diversity-sensitive social work services. The course: (1) builds sensitivity to human diversity by addressing multiple status dimensions (race, ethnicity, gender, sexual orientation, social class, etc.); (2) involves students in the process of diversity sensitization through experience self-reflection and interactive exercises; and (3) promotes diversity competent practice skills. (SP) Staff

279. Seminar in the History and Philosophy of Social Work. (2) Two hours of seminar per week. Primarily for doctoral students. A review of efforts to conceptualize the field of social welfare and to analyze its tendencies. (SP) Gilbert

280. Introduction to Social Welfare Research. (2) One hour of lecture and one hour of discussion per week. Introduction to research in social welfare. (SP) Staff

282A-282B. Seminar in Social Welfare Research. (2) Two hours of seminar per week. Prerequisites: 280. Problem formulation, design, and implementation. (F) Staff

287. Research Resources and Processes. (2) Two hours of seminar per week. Must be taken on a satisfactory/unsatisfactory basis. Students will be introduced to the tasks and tools of library research in social welfare, including reference services, bibliographic aids, and computer databases. Individual faculty members will present their research, emphasizing methodology, outcomes, and contributions to social welfare. (F) Staff

289A. Research Methods and Techniques in Social Welfare. (2) Two hours of lecture per week. The logic of social research: topics include rationale and procedure of research design, validity, reliability, and an introduction to sampling. (F) Staff

289C. Introduction to Regression. (3) Four hours of lecture/discussion per week. Prerequisites: Public Health 142 and 145. Course addresses the strengths and weaknesses inherent in linear regression analysis. Problems, detection, and treatment are explored in a lecture/discussion/"hands-on" computer laboratory format.

293. Social Welfare Theory: Policy Implications. (2) Two hours of lecture/discussion per week. Prerequisites: Graduate standing. The course deals primarily with macro-theories of a sociological and political/economy nature that offer: (1) conceptual representations of welfare systems; (2) explanations of the social impact of macro-level systems; and (3) assessments and analyses of the different normative perspectives that inform policy making in social welfare. The latter aspect is given particular emphasis and the major normative theoretical perspectives in the field will be reviewed with reference to their policy implications for social welfare in the United States. The major theoretical perspectives to be discussed include institutionalism, welfare pluralism, neo-liberalism, welfare liberalism, economic, multiculturalism, feminism, economic, and developmentalism. This course is designed for doctoral students but is open to other qualified graduate students with instructor permission. (SP)
Sociology
(College of Letters and Science)

Department Office: 410 Barrows Hall, (510) 642-4766
sociology.berkeley.edu
Chair: Kim Voss, Ph.D.

Professors
Victoria E. Bonnell, Ph.D. Harvard University. Historical, labor, Russian sociology.
Michael Burawoy, Ph.D. University of Chicago. Labor, comparative economic sociology.
Laura Enriquez, Ph.D. University of California, Santa Cruz. Latin American and social policy.
Peter Evans, Ph.D. Harvard University. Comparative development, Latin America, state and industrialization.
Claude S. Fischer, Ph.D. University of Wisconsin. Urban networks, history, technology.
Neil Fligstein, Ph.D. University of Wisconsin. Social stratification and class, methodology and statistics, complex organizations.
Thomas Gold, Ph.D. Harvard University. Modernization/development, comparative, China.
Heather A. Haveman, Ph.D. University of California, Berkeley. Organizational theory, economic sociology, historical sociology.
Jerome Karabel, Ph.D. Harvard University. Education, stratification, intellectuals, political economy.
John L. Lie, Ph.D. Harvard University. Social theory, political economy.
Samuel R. Lucas, Ph.D. University of Wisconsin. Social stratification, education, research methods.
Kristin Luker, Ph.D. Yale University. Gender, population, medicine.
Trond K. Petersen, Ph.D. University of Wisconsin. Career systems, financial behavior.
Raiya Ph.D. University of Wisconsin. Political sociology, social movements, gender, research methods.
Martin Sánchez-Jankowski, Ph.D. Massachusetts Institute of Technology, Deviance, political, urban, youth.
Ann Swidler, Ph.D. University of California, Berkeley. Culture, religion, theory, organizations.
Barrie Thorne, Ph.D. Brandeis University. Gender, childhood.
Kim Voss, Ph.D. Stanford University. Labor, movements, historical, methodology.
Loic Wacquant, Ph.D. University of Chicago. Racial domination, state and society, comparative urban studies.
Margaret Weir, Ph.D. University of Chicago. Political sociology.
Robert N. Bellah (The Elliot Chair Emeritus). Ph.D.
Robert Blauner (Emeritus), Ph.D.
Kenneth E. Bock (Emeritus), Ph.D.
Manuel Castells (Emeritus), LL.B., Ph.D.
Nancy J. Chodorow (Emerita), Ph.D.
Robert E. Cole (Emeritus). Ph.D.
Troy Duster (The Chancellor’s Professor Emeritus). Ph.D.
Charles Y. Glock (Emeritus). Ph.D.
Arie R. Hochschild (Emerita). Ph.D.
David Matza (Emeritus). Ph.D.
Richard J. (Emeritus). Ph.D.
Neil J. Smelser (Emeritus). Ph.D.

Associate Professors
Irene Bloemraad, Ph.D. Harvard University. Immigration, political sociology, race and ethnicity.
Marion Fourcade-Gourinchas, Ph.D. Harvard University. Economic sociology, culture, political sociology.
Jennifer Johnson-Hanks, Ph.D. Northwestern University. Demography, law, family.
Dylan Ridley, Ph.D. University of California, Los Angeles. Comparative historical sociology, social theory.
Sandra Smith, Ph.D. University of Chicago. Ethnicity, social capital and social networks, stratification.
Chuan Tugai, Ph.D. University of Michigan. Political sociology. social movements, religion.

Assistant Professors
Cydelle Fox, Ph.D. Harvard University. Race and ethnicity, migration and immigration, political sociology.
Stephen Vaisey, Ph.D. University of North Carolina, Chapel Hill. Cultural sociology, statistics, sociology of education.
Robo Wilier, Ph.D. Cornell University. Social psychology, collective action, gender/masculinity.

Affiliated Professors
Lauren B. Edelman, Ph.D. Stanford University. Law and sociology, social inequalities and labor markets.
W. Russell Ellis Jr., Ph.D. University of California, Los Angeles. Sociology, political sociology.
Stephen Shorter, Ph.D. University of Chicago. Medical sociological (Public Health).

Overview of Undergraduate Curriculum

The Department of Sociology is a product of the depth and breadth of its faculty, in particular their varying fields of interests and methodological styles, as well as the high caliber and diversity of the students they attract. The department offers intellectual scope and theoretical strength. Current faculty are currently engaged in advanced research and empirical studies in the following fields, among others: social inequalities, race and ethnic relations, gender, education, political sociology, development and globalization, economy and society, organizations and work, sociology of culture, social networks, religion, social psychology, historical and comparative studies, demography, urban sociology, poverty, welfare states, and social theory. Lower division courses are offered to introduce students to the field of sociology and provide critical tools in evaluating research studies in the field. Sociology survey courses provide further overview and introduction to various substantive areas within sociology. The department offers a wide variety of more specialized upper division courses as well as seminars that focus on advanced topics and research in the field.

Students intending to major in sociology are advised to prepare themselves by taking background work in such other areas as history, philosophy, cultural anthropology, psychology, economics, and political science. Students who plan to go on to graduate school in sociology and related disciplines or professions or who plan to participate in the senior honors seminar are strongly urged to take advanced sociological methods: Sociology 105, 106, or 107A-107B.

Major Requirements

Students in the College of Letters and Science may complete a major in sociology, by completing all 12 major requirements listed below with at least a 2.0 major GPA.

Lower Division Prerequisites. Sociology 1, Sociology 5, as well as a course in either statistics or logic. Students who have received credit for more than two upper-division sociology courses before taking an introductory sociology course must substitute another survey course for Sociology 1. Students may declare as soon as they have enrolled in this prerequisite. At least one sociology course must be completed at the time of declaration. Students are required to have a 2.0 GPA both cumulative and in the major to be eligible to declare the major, and to maintain academic good standing in the major.

Upper Division Course Requirements.

Theory requirement: Two courses in sociological theory:
- Sociology 101 and 102;
- Sociological Theory I and Sociological Theory II (formerly Sociology 109A and 109B).

Sociology 101 and 102 requirements: Sociology majors are required to take two courses from the following list of sociology “survey” courses, each from a different substantive area in sociology. Students may take these courses under the new or old number, if there was a change in spring 2010:
- 110, Organizations and Social Institutions;
- 120 (formerly 143), Economy and Society;
- 130 or 130AC, Social Inequalities;
- 140, Politics and Social Change;
- 150, 150A, Social Psychology, or L&S 180V;
- 160, Sociology of Culture;
- 180C, 180E, 180L, or 180P (formerly 122, 122A), Comparative Perspectives and Area Studies in Sociology.

Additional courses in each of these areas are grouped together under similar numbers to the applicable survey course, e.g. other courses in organizations and social institutions will be in the 110 number—111, 112. Students are strongly advised to take the survey course for that substantive area before other courses in that area, though this is not a requirement. The survey course serves as a foundation for all other courses in that substantive area.

Sociology electives: Four additional upper-division sociology courses, not already used for other sociology major requirements, or graduate sociology courses (subject to instructor approval). Courses taken from the survey course list in excess of the two required, or additional upper division seminar courses, will count as electives.

Capstone seminar/research: One seminar course that will serve as the capstone experience in sociology: 190, H190B, 190AC, 107B, and possibly another advanced sociology courses (see an under-graduate adviser).

Note: Sociology 5, 101, and 102 must be completed with at least a C- grade.

Honors Program. Majors who enter their senior year with a 3.3 GPA overall and a 3.5 GPA in the major may apply to the Honors Program, after conferring with a major adviser. Students will be required to submit an acceptable thesis proposal as part of their application and are encouraged to take advanced research courses, such as Sociology 105, 106, and 107A in preparation for conducting research for their honors thesis. Students earn honors by maintaining the minimum GPA for honors and by successfully completing Sociology H190A-190B, Senior Honors Thesis and Seminar.

The Graduate Program

Information about the graduate program and admissions may be obtained from the Department of Sociology website at sociology.berkeley.edu or from the graduate office at 422 Barrows Hall, (510) 642-1445. Applications are accepted for the fall semester only; the deadline is December 13.

For more detailed information about the courses that follow, course descriptions are available on the Department of Sociology website at sociology.berkeley.edu several months before the beginning of each semester.

Lower Division Courses

1. Introduction to Sociology. (4) Not open to students who have taken 3, 3A, or 3AC. Two hours of lecture and two hours of discussion per week. Introduces students who are considering majoring in sociology to the basic topics, concepts, and principles of the discipline. This course is required for the major; 1 or any version of 3 is prohibited for other sociology classes; students not considering a sociology major are directed to any version of 3.

3AC. Principles of Sociology: American Cultures. (4) Students will not receive credit for 3 or 3AC after taking 1. Deficiency in 3-3AC may be remedied by completing 3AC. No credit for 3AC after 3 or 3A. Three hours of lecture per week. Comparing the experience of three out of five ethnic groups (e.g., African Americans, Asian Americans, Chicano/Latino, European Americans, and Native Americans), students will examine historically how each people entered American society and built communities and transformed their cultures in the process. Students will be introduced
to the sociological perspective, characteristic meth-
ods of research, and such key concepts as culture, community, class, race, social change, and social movements rise. Some of these satisfies the American Cultures requirement. (F,SP)

5. Evaluation of Evidence. (4) Three hours of lec-
ture and two hours of discussion per week. A review of
methodological problems in assessing data relating to
social topics. To be covered include posing a research problem, gathering and analyzing data, measuring, establishing correlation and causal con-
nection among data, and relating data to theoret-
cal context.

24. Freshman Seminars. (1) Course may be repeated for credit. It varies. One hour of seminars per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F,SP)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments, and topics vary from department to department and from semester to semester. (F,SP)

98. Directed Group Study. (1-4) Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/ not passed basis. Prerequisites: Consent of instructor. Group study involves pursuing study in subfields of sociological theory. The course presumes a general background in social theory.

101. Sociological Theory I. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC, or consent of instructor. Formerly 101A. First half of a year-long course on the history of social thought as a source of present-day problems and hypotheses. (F,SP)

102. Sociological Theory II. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC, or consent of instructor. Formerly 101B. Second half of a year-long course on the history of social thought as a source of present-day problems and hypotheses. (F,SP)

103. Advanced Study in Social Theory. (4) Three hours of lecture per week. Prerequisites: 101A-101B or 101 and 102. Formerly 102. Course involves pursuing study in subfields of sociological theory. The course presumes a general background in social theory.

105. Introduction to Sociological Methods. (5) Three hours of lecture and two hours of discussion per week. Prerequisites: 5 or consent of instructor. Problems of research design, measurement, and data collection, processing, and analysis will be consid-
ered. Attention will be given to both qualitative and quantitative studies. (F)

106. Quantitative Sociological Methods. (4) Two hours of seminar per week and individual conferences. Prerequisites: 1, 3, 3AC, or consent of instructor. This course will cover more technical issues in quantitative re-
search methods introduced in 105 and include, accord-
ing to discretion of instructor, a practicum in data collection and analysis. Recommended for students interested in graduate work in sociology or research careers. (SP)

107A-107B. Field Research: Participant Obser-
vation. (4;5) Three hours of lecture per week. Credit and grade to be awarded on completion of se-
quence. This course, taught by an experienced sociologist with an substantive background and practical training in the participant-
observation method. The first semester will be classroom based to introduce the method. In the second semester, students will put the method into practice as they are sent to the field to gather data, measuring, establishing correlation and causal con-
nection among data, and relating data to theoret-
cal context. (F)

110. Organizations and Social Institutions. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This survey course studies administrative organizations and voluntary associations; major social institutions in industry, gov-
ernment, religion, education, and recreation. (F,SP)

111. Sociology of the Family. (3) Three hours of lecture and one hour of discussion per week. Prereq-
quisites: 1, 3, 3AC, or consent of instructor. In this course, we trace the history of American family from the 19th-century farm—in which work, medical care, and entertainment went on—to the smaller, more diverse, and subjectively defined family of the 21st century. We also explore ways in which the family acts as a "shock absorber" of many trends including immigration, the increasing social class divide, and especially the growing domination of the marketplace. Finally, we also explore the diversity of family forms associated with social class, ethnicity, and sexual or-
ientation. (F,SP)

111C. Sociology of Childhood. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course focuses on children and on varied contexts and experiences of growing up; it also highlights the social organization and meanings of childhood. (F,SP)

111P. Families, Inequality, and Social Policy. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course explores the rela-
tionships between changes in how Americans are experiencing family life, growing inequality in the United States, and the way social policy “solutions” aimed at fam-
ilies and children. While discussing these trends and changes and their social consequences, we will discuss government responses to these changes, how debates are framed, who debates, and how other internationalized countries consider these ques-
tions. (F,SP)

112. Sociology of Religion. (4) Three hours of lec-
ture and two hours of discussion per week. Prereq-
uites: 1, 3, 3AC, or consent of instructor. The course will locate religion within the current state of religious and cultural and historical perspectives. In its structure and functions; male-female role contrasts, race and sport; economics of sport; the roles of coach, athlete, fan— their interrelationships and complexities; current politics and issues in sport and the ideological struggle which has emerged.

120. Economy and Society. (4) Three hours of lec-
ture per week. Prerequisites: 1 or 3 or 3AC or con-
sent of instructor. Formerly 143. This survey course focuses on three major themes of the contemporary United States: government, resources, and cities. Stress on the importance of transition from the 1960s. Examination of how each sector is influenced by policy currents, economic trends, and social conflicts.

121. Innovation and Entrepreneurship: Social and Cultural Context. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course will examine the social and cultural environ-
ment that enables or hinders the innovation process in business. The course covers how com-
panies can create and foster innovative cultures and organize for innovation, and reviews differences between countries in innovativeness. It continues by exploring the factors influencing national and other inno-
vations are or are not adopted. It addresses some social and ethical issues of innovation, examines the social role and context of entrepreneurs, and closes with some case studies.

123. Corporate Social Responsibility and Green Business. (4) Three hours of lecture per week. Pre-
requisites: 1, 3, 3AC, or consent of instructor. A cor-
poration is a “citizen” of a society and, like all other citizens, has certain legal, regulatory, moral, and eth-
ical responsibilities. This course will examine the limits of corporate social responsibility and examples of good and bad corporate citizenship based on some of those definitions, with an emphasis on “green business,” which is the practice of businesses that minimize their impact on the environment. (F,SP)

124. Sociology of Poverty. (4) Deficiency in 124AC cannot be removed by completing 124. No credit for 124 after 124AC. Three hours of lecture per week. Prereq-
uites: Introductory sociology or consent of instruc-
tor. This course will examine the causes of poverty. It will examine a number of theories on the causes of poverty, then turn to an examination of empirical stud-
ies concerning the trends and determinants of poverty, and concludes with a study of the daily life of those who live in the condition of poverty. This course

116G. Working People in the Global Economy. (4) Students will receive no credit for C116G after taking 116 in spring 2008 or Letters and Science 120G. Three hours of lecture and two hours of dis-
cussion per week. Work is central to our identities, self-esteem, well-being, and social status. How soci-
eligates organize work shapes the distribution of rewards and power, not just in the workplace but in society at large. Everyone’s work is profoundly shaped by the way it connects to other people’s labor around the globe. Using a variety of disciplinary lenses, we will look at how workers make sense of the organized efforts of working people have shaped the nature of jobs and social change. Also listed as Letters and Science C150T. (F,SP)

C116G

117. Sport As a Social Institution. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or con-
sent of instructor. Formerly 117. This course focuses on the sociological perspective on sport, examining the structure and functions of sport, its influence on the social world, and the role of sport in society. Also listed as Letters and Science C150T. (F,SP)

150H

*Professor of the Graduate School
will conclude with a look at social policy toward poverty. The course will focus primarily, although not exclusively, on poverty in the United States. While there will be some things concerning rural poverty, the course will have a decidedly urban focus. (F,SP)

C126. Social Consequences of Population Dynamics. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Introduction to population issues and the factors by which human populations grow and decline. Emphasis on patterns and processes throughout history and the future. The course will focus on major theoretical perspectives on development of poor countries of Asia, Africa, and Latin America. Societal and political change, focusing on the socioeconomic and political change, focusing on the historical, political, and demographic aspects of these changes. (F,SP)

127. Development and Globalization. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 172. A comparative analysis of socioeconomic and political change, focusing on the poor countries of Asia, Africa, and Latin America. Offers both a basic descriptive understanding of processes of change in these countries and an introduction to major theoretical perspectives on development and globalization. (F,SP)

128. Society and the Environment. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Living in an urban area at the end of the 20th century, it is easy to forget how the city has become a biophysical world to us. This course seeks to explore the relationships between society and the environment and how we have viewed our time and space. The approach taken will be both historical and cultural. Key terms and concepts include environmental problems, social movements, and the environment, and the environmental implications of late capitalism. (F,SP)

130. Social Inequalities. (4) Students cannot take 130 to remove a deficient grade in 130AC. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This survey course studies inequality, social classes in local communities and the nation as related to interest organizations. (F,SP)

130AC. Social Inequalities: American Cultures. (4) Students will receive no credit for 130AC after taking 130; a deficient grade in 130AC may be removed by taking 130AC. A deficient grade in 130AC can only be removed by repeating the course. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This course explores the causes and consequences of inequality in the United States. First, we will discuss theories and concepts scholars use to understand the social inequality that is produced in society. We will examine institutions that sustain, reproduce, and/or mitigate inequality in the United States, such as education, labor markets, family structure, and the criminal justice system. Without each topic, we focus attention to the invisibility of race and ethnicity, social status, and gender. This course satisfies the American Cultures requirement. (F,SP)

131. Race and Ethnic Relations: The U.S. Experience. (4) Students will receive no credit for 131 after taking 131A. A deficiency in 131 may be removed by taking 131. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 131A. Course focuses on race and ethnic relations in the United States. Examination of historical experiences, contemporary circumstances and future prospects of racial and ethnic populations with particular attention to trends in relations between the dominant society and the African American, Native American, Asian American, and Latino subcultures. Political and social consequences of racial and ethnic stratification are explored. (F,SP)

131A. Race and Ethnic Relations: U.S. American Cultures. (4) Students will receive no credit for 131A after taking 131 or 131A. Deficiency in 131 or 131A may be removed by 131A. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Course focuses on race and ethnic relations in the United States. Examination of historical experiences, contemporary circumstances and future prospects of racial and ethnic populations with particular attention to trends in relations between the dominant society and the African American, Native American, Asian American, and Latino subcultures. Political and social consequences of racial and ethnic stratification are explored. (F,SP)

131AC. Race and Ethnic Relations: U.S. American Cultures. (4) Students will receive no credit for 131AC after taking 131 or 131A. Deficiency in 131 or 131A may be removed by 131AC. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 131. Four Centuries of Racial Vision and Division in the United States. (4) No credit for 131F after taking 131F. Three hours of lecture per week. Prerequisites: 1, 2, 3AC or consent of instructor. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Course focuses on race and ethnic relations in the United States. Examination of historical experiences, contemporary circumstances, and future prospects of racial and ethnic groups will be discussed with particular attention to trends in relations between the dominant society and the African American, Native American, Asian American, and Latino subcultures. Political and social consequences of racial and ethnic stratification are explored. This course satisfies the American Cultures requirement. (F,SP)

131F. Four Centuries of Racial Vision and Division in the United States. (4) No credit for 131F after taking 131F. Three hours of lecture per week. Prerequisites: 1, 2, 3AC or consent of instructor. Course focuses on race and ethnic relations in the United States. Examination of historical experiences, contemporary circumstances, and future prospects of racial and ethnic groups will be discussed with particular attention to trends in relations between the dominant society and the African American, Native American, Asian American, and Latino subcultures. Political and social consequences of racial and ethnic stratification are explored. This course satisfies the American Cultures requirement. (F,SP)

132. Social Movements and Political Action. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This survey course studies the relationship between society and politics through an analysis of the intersection of economic development, social relations, and the political sphere. Examine how class, race, ethnicity, and gender interact with political culture, ideology, and policies. The course analyzes the history of political behavior, a key aspect of politics. (F,SP)

134. Social Change. (4) Students will receive no credit for 134 after taking 134AC. Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 170. Study of major changes in modern societies: the sources of these changes; the processes through which they spread; their meaning for individuals and institutions. (F,SP)

135. Sexual Cultures. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Course examines how sexual identities, communities, desires, and practices are socially, historically, and culturally constructed. We will look at how people reproduce models of sexuality, as well as how a wide range of people— including lesbians, bisexuals, gay men, transgendered, and self-described queers—contest the power that operates through dominant models of sexuality. Looking at empirical studies and theoretical texts, we will trace the paradigm shift from late 19th-century sexuality to early 20th-century psychoanalysis, through a variety of approaches in the 1960s and 1970s to the feminist and queer theory of recent decades. (F,SP)

136. Urban Sociology. (4) Students will receive no credit for 136 after taking 125 or 125AC. Deficiency in 125 may be removed by taking 136. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 125. The nature, causes, consequences of world urbanization; metropolitan areas; location and types of cities; social and demographic characteristics of urban populations. (F,SP)

137AC. Environmental Justice: Race, Class, Equity, and the Environment. (4) Students will receive no credit for 137AC after taking Environmental Science, Policy, and Management 163AC. Deficiency in Environmental Science, Policy, and Management 163AC may be removed by 137AC. Two hours of lecture and one hour of discussion per week. Formerly 128AC. Overview of the field of environmental justice, analyzing the implications of race, class, labor, and equity on environmental degradation and regulation. Environmental justice movements and struggles within poor and people of color communities in the United States, including African Americans, Latino Americans, Native Americans, and Asian Americans. Specialized topics in social inequalities that are not regularly offered in the curriculum may occasionally be offered under this number. The focus of the course will vary depending on the instructor and the survey course in which it is offered. This course in 137AC is recommended before taking this course. (F,SP)

140. Politics and Social Change. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This survey course studies the relationship between society and politics through an analysis of the intersection of economic development, social relations, and the political sphere. Examine how class, race, ethnicity, and gender interact with political culture, ideology, and policies. The course analyzes the history of political behavior, a key aspect of politics. (F,SP)

141. Social Movements and Political Action. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 170. Study of major changes in modern societies: the sources of these changes; the processes through which they spread; their meaning for individuals and institutions. (F,SP)

142. Sociology of War and Conflict. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Violent and peaceful procedures in the pursuit of national objectives; analysis of attempts to specify the causes of war. (F,SP)

145. Social Change. (4) Students will receive no credit for 145 after taking 145AC. Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 170. Study of major changes in modern societies: the sources of these changes; the processes through which they spread; their meaning for individuals and institutions. (F,SP)

145AC. Social Change: American Cultures. (4) Students will receive no credit for 145AC after taking 145, 170, or 170AC. Deficiency in 145 may be removed by taking 145AC. Three hours of lecture per week. Prerequisites: Sociology 1, 3, 3AC. Formerly 170AC. This course will seek to explain the formation of modern U.S. society by inquiring into the processes of social reproduction as well as created possibilities for the future. Race, nationalism, and ethnicity—and movements against racism and nationalism and for multiculturalism—are central dimensions of social change in the United States. The course will explore the processes of social change as they affect and are affected by different racial and ethnic groups in the United States. This course satisfies the American Cultures requirement. (F,SP)

145L. Social Change in Latin America. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 187. This course will introduce students to the origins and nature of social change in contemporary Latin America. A social-historical approach will be used to describe the region’s development, which will lay the groundwork for understanding the emergence in recent decades of movements promoting social change there. While focusing particularly on Latin America, the course will also provide the theoretical and analytical tools required to comprehend social change elsewhere in the Third World. (F,SP)

146. Contemporary Immigration in Global Perspective. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. The goal of this course is to introduce students to important academic and political debates around immigration, to discuss processes of immigration, integration and
150. Social Psychology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This survey course examines many of the theoretical approaches to social psychology. The approaches may include symbolic interactionism, neo-behaviorism, psychodynamic analyses, cognitive theories, and social processes, and theories of exchange. (F,SP)

150A. Social Psychology: Self and Society. (4) Students will receive no credit for 150A after taking 150A or Letters and Science C180V. Deficiency in 150A or Letters and Science C180V may be removed by taking 150A. Three hours of lecture per week. This survey course provides tools from social psychology to help students develop a better understanding of their own and others' behavior. Social psychology is a field that bridges sociology and psychology, and primarily concerned with how individuals view and interact with one another in everyday life. The class is organized around a survey of the great ideas from the history of social psychology. We will study research on a wide variety of topics including conformity, obedience, identity, power, status, and interpersonal perception. (SP)

151A. Social Psychology: Self and Society. (4) Students will receive no credit for 151A after taking 151A or Letters and Science C180V, or a deficiency in 151A or Letters and Science C180V may be removed by taking 151A. Three hours of lecture per week. This survey course provides tools from social psychology to help students develop a better understanding of their own and others' behavior. Social psychology is a field that bridges sociology and psychology, and primarily concerned with how individuals view and interact with one another in everyday life. The class is organized around a survey of the great ideas from the history of social psychology. We will study research on a wide variety of topics including conformity, obedience, identity, power, status, and interpersonal perception. Also listed as Letters and Science C180V. (F,SP)

151. Personality and Social Structure. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F,SP)

152. Deviance and Social Control. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC or consent of instructor. This course examines how social norms are created, maintained, and broken, and how these norms affect individuals and society. This course introduces the subject of deviant behavior and the effects of deviant actions on others. (F,SP)

152. Deviance and Social Control. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1, 3, 3AC or consent of instructor. This course examines how social norms are created, maintained, and broken, and how these norms affect individuals and society. This course introduces the subject of deviant behavior and the effects of deviant actions on others. (F,SP)

153. Sociology of Culture. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This course examines how social norms are created, maintained, and broken, and how these norms affect individuals and society. This course introduces the subject of deviant behavior and the effects of deviant actions on others. (F,SP)

153. Sociology of Culture. (4) Three hours of lecture and two hours of discussion per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. This course examines how social norms are created, maintained, and broken, and how these norms affect individuals and society. This course introduces the subject of deviant behavior and the effects of deviant actions on others. (F,SP)

154. Social Networks. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course explores the relationship between social networks and the development of human behavior, focusing on the role of social networks in shaping individual and group behavior. (F, SP)

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157. Virtual Communities/Social Media. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course examines the development and impact of virtual communities and online social networks, old questions about the meaning of human social behavior have taken on renewed significance. Using a variety of online social networks, and drawing upon theoretical literature in a variety of disciplines, this course delves into discourse about community across disciplines. This course will enable students to establish research questions and marking rules for making decisions and judgments regarding the relations between mediated communication and human community. (F, SP)

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158. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F, SP)

158. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F, SP)

160. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F, SP)

160. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F, SP)

160. Sociology of Culture. (4) Three hours of lecture per week. Prerequisites: 1, 3, 3AC, or consent of instructor. This course addresses how individual personalities develop by the wider society: how a person's locations in a culture, an historical era, and within a society affect how they think, what they feel, and how they express their personalities. (F, SP)

161. Historical Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 171. Study of the major concepts, problems and research in the field of historical sociology, with attention to such topics as industrialization, revolution, transformation of social structure, social life, political authority, institutions and sociology viewed from an historical and comparative perspective. (F, SP)

161. Historical Sociology. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 171. Study of the major concepts, problems and research in the field of historical sociology, with attention to such topics as industrialization, revolution, transformation of social structure, social life, political authority, institutions and sociology viewed from an historical and comparative perspective. (F, SP)

162. Elementary Forms of Racial Domination: Inter- national Perspectives. (4) Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. Formerly 131B. A broad survey of race and ethnicity in modern societies in a wide range of geographic contexts, with special attention to comparisons with the present and past patterns in the United States. Emphasis on social, economic, political, institutional, social psychological, and demographic perspectives. (F, SP)

163. Contemporary Chinese Society. (4) Students will receive no credit for 183 after taking C183. Three hours of lecture per week. Prerequisites: 1 or 3 or 3AC or consent of instructor. An introduction to institutions, social groups, and values in contemporary Chinese society. Dynamics of social change in a revolu- tionary and post-revolutionary setting. Trends in the future development of Chinese society. (SP)

164. Family and Household in Comparative Per- spective. (3) Three hours of lecture per week. Prerequisites: 1, 3, 3AC or consent of instructor. Formerly C127. How are families and households organized around the world? Which aspects of household and family vary, and which are constant? What are the forms of kinship and the nature of exchange? How are family patterns transmitted? (F,SP)
205. Supervised Preparatory Coursework. Prerequisites: Consultation with and approval of regular faculty member responsible. Introductory study of a sociological field, among those listed in the 280 series, including participation in the appropriate undergraduate course in that field. Also includes individual meetings with the faculty sponsor, who may stipulate additional requirements.

205A. Law and Deviance. (3)

205B. Race and Ethnic Relations. (3)

205C. Political Sociology. (3)

205D. Organizations. (3)

205E. Industrial Sociology. (3)

205F. Family and Life Cycle. (3)

205G. Social Stratification and Class Analysis. (3)

205H. Development and Modernization. (3)

205L. Religion. (3)

205J. Urban Sociology. (3)

205K. Social Psychology. (3)

205L. Gender. (3)

205M. Culture. (3)

205N. Education. (3)

205O. Health and Medicine. (3)

205P. Area Studies. (3) Course may be repeated for credit as topic varies.

205Q. Economy and Society. (3)

205R. Professions. (3)

205S. Social Movements. (3)

205U. Society and Environment. (3)

205V. Society and Technology. (3)

271A-271C. Methods of Sociological Research. (4:3:3) 271A: Four hours of lecture per week. 271B-271C: Two hours of lecture and two hours of laboratory per week. Prerequisites: Consent of instructor. A three-semester sequence course introducing logical and analytic techniques commonly employed in social science research. The methodological problems encountered in fieldwork, historical and comparative inquiry, experimental research, and survey analysis. The first semester concentrates on techniques for gathering evidence; the second and third semesters focuses on beginning and intermediate numerical techniques for analyzing evidence.

271D. Quantitative/Statistical Research Methods in Social Sciences. (3) Two hours of lecture per week. Prerequisites: Consent of instructor. Selected topics in quantitative/statistical methods of research in the social sciences and particularly in sociology. Possible topics include analysis of qualitative/categorical data; loglinear models and latent-structure analysis; the analysis of cross-classified data having ordered and unordered categories; measure, models, and graphical displays in the analysis of cross-classified data; correspondence analysis, association analysis, and related methods of data analysis. Also listed as Statistics C261.

272. Studies in Sociological Research Methods. Course may be repeated for credit. Prerequisites: Consent of instructor. Courses under this number involve pursuing graduate study in subfields of sociological research methods.

272A. Research Design. (3)

272C. Comparative and Historical Research. (3)

272D. Quantitative Statistical Research. (3)

272E. Participant Observation. (3)

272F. Interview Methods. (3)

272G. Experimental Methods. (3)

273. Advanced Seminars in Research Methods. Course may be repeated for credit. Two hours of sem-
inar per week. Seminar in advanced sociological research methods. 273D. Quantitative/Statistical Research. (3)
273E. Participant Observation. (3)
273F. Interview Methods. (3)
280. Advanced Study in Substantive Sociological Fields. Course may be repeated for credit. Two hours of lecture per week. Prerequisites: Undergraduate preparation in the field; completion of a 205 in the field or an equivalent determined by the instructor. Courses under this number involve pursuing graduate study in substantive sociological subfields. The courses presume familiarity with the fields of study. Consult departmental catalog for current descriptions.
280A. Law and Deviance. (3)
280A-A. Sociology of Poverty. (3) This course introduces students to the sociology of poverty by understanding its causes and conditions. Poverty is part of the social stratification system as well as a condition with properties that characterize the individual living with extreme material scarcity. Thus, it involves both the social and the physical world. The course will engage a broad literature on poverty that incorporates research from sociology, economics, and anthropology. We also will consider structure, culture, and agency in creating and maintaining individuals and groups in the condition of poverty.
280B. Race and Ethnic Relations. (3)
280C. Political Sociology. (3)
280D. Organizations. (3)
280E. Sociology of Work. (3)
280F. Family and Life Cycle. (3)
280G. Social Stratification and Class Analysis. (3)
280H. Development and Modernization. (3)
280I. Religion. (3)
280J. Urban Sociology. (3)
280K. Social Psychology. (3)
280L. Gender. (3)
280M. Culture. (3)
280N. Education. (3)
280P. Area Studies. (3)
280Q. Economy and Society. (3)
280R. Professions. (3)
280S. Social Movements. (3)
280T. Rural Sociology. (3)
280W. Sexuality. (3) In this course we address a wide range of literal theories and sociological investigations of sexuality as it is conceptualized and experienced in social contexts. Theoretical approaches to sexuality may include psychoanalytic, feminist, Marxist, symbolic-interactionist, and discursive/post-structural approaches to understanding how sexual categories vary over time and across cultures, how people identify with or against them, and how social power works through time.
280X. Immigration and Incorporation. (3) This seminar examines the dynamics of migration, integration, and citizenship, both from the perspective of the receiving society and from the lived experiences of migrants themselves. The seminar focuses on processes of incorporation into economic, social, cultural, and political—but we also look at paradigms that challenge an integrationist reading of migration, in particular transnationalism and models of postnational citizenship.
280Y. Sociology of Globalization. (3) Two hours of seminar per week. Sociology now analyzes social interactions that transcend national boundaries, not just as linking national societies or as influencing national societies but as a phenomenon in its own right. This course brings together a selection of literature that looks at transnational social organizations, and the distinctive dynamics of global political economic and culture and offers a sociological perspective on what lies behind the vague and confusing label of “globalization.”
280Z. Social Policy. (3) This course will examine the major theoretical arguments that seek to account for the development of social policy, including arguments about the power of social forces such as business and labor, the role of racial and ethnic division, the influence of ideas, and the organizational features that help us to prepare them to develop. The course works in the United States with some comparison to other countries.
285. Dissertation Seminar. (3) Course may be repeated for credit. Three hours of lecture per week. Must be taken on a pass/fail/permit basis. Prerequisites: Consent of instructor. The seminar is a forum for intensive attention to writing of seminar members at any stage, from initial planning of the dissertation to the job presentation talk. We will be especially concerned with reflexive issues: the choice of problem and method as a sociological, political, personal, and market issue; the place of the researcher in research, and sociology as a discipline and interdisciplinary. Problems of organization, scope, theoretical, and empirical emphasis will also be addressed.
286. Professional Writing Seminar. (3) Three hours of lecture/workshop per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. This seminar is a workshop on professional writing for sociologists. We will focus on editing, rewriting, re-editing, and re-sewing seminar members’ papers with the goal of completing a paper appropriate for the professional journals. In addition, we will cover several topics in writing, including psychological inhibition, style, journals, writing for the general public, and the work of book publishing. Class time will be divided into short lectures and workshop periods, during which we will discuss work-in-progress and do some collective editing of sample texts.
289. Seminar. (3) Course may be repeated for credit as topic varies. Two hours of seminar per week. Prerequisites: Consent of instructor. Advanced study in modern sociology. The specific topics will be announced at the beginning of each semester.
292. Advanced Research Seminar. (1) One hour of seminar per week or two hours of seminar every other week. Must be taken on a satisfactory/unsatisfactory basis. The purpose of this seminar is to provide participants with an opportunity to present their work-in-progress, be it a potential academic journal submission, dissertation chapter, dissertation prospectus or even a draft interview schedule. Through a process of peer review, we will work on improving each participant’s written work, and to stay abreast of the diverse work being done in the field of the seminar’s topic.
295. Independent Study for Graduate Students in Sociology. (1-12) Course may be repeated for credit. Independent study, variable hours. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. By arrangement with faculty. (F,SP)
296. Directed Dissertation Research. (1-12) Course may be repeated for credit. Independent study, hours vary. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. By arrangement with faculty. Open to qualified students advanced to candidacy. (F,SP)
298. Directed Group Studies for Graduates. (1-9) Course may be repeated for credit. Group conferences on a satisfactory/unsatisfactory basis. Prerequisites: Consent of instructor. Group studies of selected topics which vary from year to year. (F,SP)
299. Individual Study and Research. (1-9) Course may be repeated for credit. Individual conferences. Prerequisites: Consent of instructor. For students engaged in individual research and study. May not be substituted for available graduate lecture courses or 290. (F,SP)
301. Professional Training: Teachers. (3-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)
304. Professional Training: Research. (3-4) Course may be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. May not be used to meet unit or residency requirements for the master’s or doctoral degree.

Sociology and Demography
(Sequence of Letters and Science)
Group Office: 2232 Piedmont Avenue, (510) 642-9800
Sociology/berkeley.edu/undergraduate/so sociodemog.html
Chair: Michael Hout, Ph.D.
Faculty
Irene Bloomfield, Ph.D. (Sociology)
Claude Fischer, Ph.D. (Sociology)
Neil Fligstein, Ph.D. (Sociology)
Leo Goodman, Ph.D. (Sociology)
Eugene Hammel, Ph.D. (Demography)
Heather Haveman, Ph.D. (Sociology)
Michael Hout (Chari), Ph.D. (Sociology)
Jennifer Johnson-Hanks, Ph.D. (Demography)
Donald Lee, Ph.D. (Sociology)
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Samuel Lucas, Ph.D. (Sociology)
Kristin Luker, Ph.D. (Sociology)
Trent Peterson, Ph.D. (Sociology)
Anne Swidler, Ph.D. (Sociology)
Kristin Luker, Ph.D. (Sociology)
Will Dow, Ph.D. (Sociology)
Jane Maulson, Ph.D. (Goldman School of Public Policy)
Steve Raphael, Ph.D. (Goldman School of Public Policy)
Graduate Adviser: John Wilmoth
Graduate Assistant: Monique Verrier

Program Overview
The Graduate Group in Sociology and Demography (GGSD) is an interdisciplinary training program in the social sciences designed for students with broad intellectual interests. Drawing on Berkeley’s Department of Sociology and Department of Demography, the Group offers students a rigorous and rewarding intellectual experience. The Group, founded in 2001, sponsors a single degree program leading to a Ph.D. in sociology and demography. The GGSD helps foster an active intellectual exchange between graduate students and faculty in two disciplines. In addition, faculty and students associated with the Group often maintain close ties with other disciplines both inside and outside the social sciences (for example, economics, anthropology, statistics, public health, biology, and medicine).

The specific emphasis of this academic program is the intersection of the fields of sociology and demography. Potential areas of study include, but are not limited to, population history, social stratification, inequality, race, ethnicity, causes and consequences of population growth, the demographic transition, population-environment interactions, economic development, immigration, globalization,
tion, gender, family, kinship, child welfare, sexuality, intergenerational relations, aging, mortality, health care, disability, fertility, family planning, and birth control.

Students in the GGSD typically earn both an M.A. in sociology and an M.A. in demography en route to the Ph.D. in sociology and demography. Students already enrolled in another graduate program at Berkeley who wish to earn a Ph.D. in sociology and demography may apply by requesting a change of major. Students not already enrolled at Berkeley who wish to enter the Ph.D. program should complete the required application and submit it to the student affairs officer in the Department of Demography’s main office. The general deadlines for application specified by the Graduate Division apply, as do the general requirements of the Academic Senate and the Graduate Division for Ph.D. degree programs.

Program Requirements

Ph.D. degree requirements include approximately 43 units of work, divided among courses from the departments of demography and sociology, plus electives from other departments (specific degree requirements are available from the graduate adviser); an M.A. research paper in sociology; a preliminary examination in demographic methods and substance; a foreign language examination; an oral qualifying examination covering four fields of study (sociological theory, general demography, and two specialized fields); and a Ph.D. dissertation. For details, visit the website, or contact the graduate assistant or graduate adviser.

South and Southeast Asian Studies

(College of Letters and Science)

Department Office: 7233 Dwinelle Hall, (510) 642-4564
sseas.berkeley.edu
Chair: Alexander von Rospott

Professors

Varunima Dalmia (The Catherine and William C. Magistretti Distinguished Professor), Ph.D., Jawaharlal Nehru University. Hindi language and literature. Hindi

Robert P. Goldman, Ph.D., University of Pennsylvania. Sanskrit literature, Indian epics

George L. Hart III (Tamil Studies Chair Emeritus), Ph.D., Alexander von Rospott, Ph.D., University of Hamburg. Buddhist studies, Buddhism in South Asia

Joanna Williams (Emeritus), Ph.D.

P. S. Janji (Emeritus), Ph.D.

James Matloff (Emeritus), Ph.D.

J. F. Staal (Emeritus), Ph.D.

Associate Professors

Lawrence Cohen, Ph.D., Harvard University. Medical anthropology

Penelope Eckert, Ph.D., Monash University. Southeast Asian cultural history

Jeffrey Hadder, Ph.D., Cornell University. Southeast Asian ethnography

Raika Ray, Ph.D., University of Wisconsin. Feminist theory, social movements

Sylvia Tiwon, Ph.D., University of California, Berkeley. Modern Indonesian literature

Peter Zimon, Ph.D., Cornell University. Southeast Asia, Vietnam

Bruce R. Pray (Emeritus), Ph.D.

Barend A. van Nooten (Emeritus), Ph.D.

Assistant Professors

Jacob Dalton, Ph.D., Michigan University. Buddhist studies, Tibetan studies

Muns Faruqui, Ph.D., Duke University. South Asian Islam

Senior Lecturer

†Usha R. Jain (Emerita), M.A.

Lecturers

Maria Jo Barrios-LeBlanc, Ph.D. University of the Philippines. Filipino literature

Sally J. Sutherland Goldman, Ph.D., University of California, Berkeley. Sanskrit language, Indian mythology

A. Lila Hadfield, Ph.D., M.A., Bombay University. Hindi language

Kausalya Harit, M.A., Annamalai University. Tamil language and literature

Susan F. Kepner, Ph.D., University of California, Berkeley. Thai language and literature

Nink Lunde, M.A., University of Wisconsin. Indonesian language

Frank Smith, M.L.S., Simmons College. Khmer

Heptzibah (Heppi) Sunkari, Ph.D., University of Madras, India. Telugu

Bac Tran, M.A., San Francisco State University. Vietnamese language, linguistics

Harth Tran, B.S., National University of Social Sciences and Humanities, Vietnam. Vietnamese language

Upkar K. Uhi, B.A., Habib University, London. Punjabi language, linguistics, and literature

Undergraduate Adviser: Prof. Tiwon

Head Graduate Adviser: Prof. Edwards

Department Overview

The Department of South and Southeast Asian Studies offers programs of both undergraduate and graduate instruction in the languages and cultures of South and Southeast Asia. It offers opportunities to explore the rich cultural, social, and religious histories as well as the living contemporary cultures of these areas. The curriculum covers the classical literary canon, religious literature, folk and popular works, oral traditions and performance media (including recitation, musical and dramatic performance, dance, media, and film), and modern literatures of the colonial and post-colonial period. Students are encouraged to take advantage of the extensive opportunities for interdisciplinary linkages by pursuing courses offered by the South and Southeast Asia faculty in other departments at Berkeley. Students are also encouraged to pursue courses and independent readings that will acquaint them with pertinent methods in the various disciplines, such as contemporary literary theory, ethnographic theory, historiography, and cultural studies. Appropriate comparative work on Asian and non-Asian cultures is encouraged as well.

The Major

The two tracks in the South and Southeast Asian studies major are flexible, interdisciplinary programs offering opportunities for both wide, comparative study of South and Southeast Asian cultures and greater concentration on a particular area of interest and geographical focus. With the guidance of the faculty and staff advisers, students might choose to pursue, for example, intense study of a language and its culture or broader inquiries into such subjects as the religious traditions of traditional and modern South and Southeast Asia. Students may include in their major programs suitable courses from other departments.

South and Southeast Asian Civilizations

Students pursuing this track must complete one lower division requirement on the civilization and culture of South Asia (SA 1A, 1B or SA 5A, 5B) or the civilization of Southeast Asia (SEA 10A, 10B).

Students must also complete a minimum of nine additional courses concerning South or Southeast Asia, at least eight of which must be upper division and at least four of which must be taken in the department.

In consultation with the adviser, students will choose an area of interest (religion or art history or literature, for example). At least two courses of the nine described above should cover this area of interest. At least three courses in the area of interest are recommended.

South and Southeast Asian Languages and Literatures

Students choosing this track must complete one lower division sequence on either the civilization and culture of South Asia (SA 5A, 5B) or the civilization of Southeast Asia (SEA 10A, 10B) and four semesters of language work (in one of the following languages: Hindi, Urdu, Bengali, Indonesian, Khmer, Panjabi, Sanskrit, Tagalog, Tamil, Telugu, Thai, and Vietnamese).

Students may establish first-year language proficiency through examinations administered by the department although passing an examination will not result in credit.

Students must also complete a minimum of four upper division courses concerning South or Southeast Asia, at least half of which must be taken in the department.

Students who are considering graduate-level study of South or Southeast Asia are strongly advised to choose the language and literatures emphasis. This would provide the minimum level of language preparation required for most graduate programs.

For both tracks: The major consists of 42-44 units (normally between 10 and 12 courses).

The undergraduate staff adviser must approve all courses taken outside the department that students intend to use for credit, including courses taken in study abroad programs. The undergraduate faculty adviser must approve any proposed academic waivers or substitutions. Among the upper division courses, it is highly recommended that students include one seminar (SSEAS 190 or an equivalent) that requires significant research and writing on South or Southeast Asia.

The Minor

The minimum requirements for the completion of a minor program are five upper division courses, of which a minimum of three must be completed in the department. All courses in the minor program must be completed on a letter-graded basis. An overall GPA of 2.0 is required in courses used for the minor program.

Honors Program

To be eligible for admission to the Honors Program, students must attain a 3.5 GPA or higher in courses completed in the major, and a 3.3 GPA in all courses completed in the University. An honors thesis is required. Students who wish to participate must choose a thesis topic in consultation with their major adviser and apply for admission to the program through the departmental office no later than the first week of spring semester of the senior year.

The M.A./Ph.D Program

This program offers emphases in the following languages and literatures: Hindi, Indonesian, Khmer, Sanskrit, Tamil, and Urdu. Literature is understood in the widest sense to include not only creative writing and cultural expression in the various genres but also sources concerning religion, philosophy, history, and the fine and performing arts. The analysis of cultural expression is also understood to include attention to social, anthropological, economic, and political contexts.

Prerequisites. The prerequisites for admission to the M.A./Ph.D. program are a minimum of two years of academic study in the language of emphasis or the equivalent, and eight undergraduate or graduate course units with South or Southeast Asia or the equivalent. Candidates with insufficient preparation are advised to apply to the M.A. program (see below). At the conclusion of the M.A. degree, students will be informed as to whether they are eligible for admission to the Ph.D. program.

Degree Requirements. The general requirements for the degree are a minimum of 10 courses undertaken in graduate status at Berkeley (including at least four graduate seminars in the language of emphasis and the methods seminar), a historical knowledge of the area of emphasis; completion of an M.A. thesis (also required of transfer stu-
Students holding the M.A. who have not completed equivalent work); and competence in one or more appropriate secondary languages.

Ph.D. candidates will complete an oral qualifying examination in three approved fields (the field of emphasis, a secondary field within the department, and a cognate field); submit a dissertation prospectus; advance to Ph.D. candidacy; and complete the dissertation under Plan B (see the Graduate Education section in this catalog). The Sanskrit emphasis also requires completion of a written competency examination in Sanskrit and one course in linguistics. Students in the Joint M.A./Ph.D. program will require the M.A. degree upon completion of 20 units of coursework in graduate status at Berkeley (including two graduate seminars in the language of emphasis, and the methods sequence in the field of emphasis in the language of emphasis; demonstration of historical knowledge; advancement to M.A. candidacy; and completion of thesis. They will acquire the emphasis in Sanskrit upon completion of the reading requirements. A thesis topic should be identified during the second semester of the program or, at the latest, by the beginning of the third semester, unless otherwise specified (see the joint Graduate Education section in this catalog). The M.A. thesis in South and Southeast studies is expected to run between 25 and 50 double-spaced, typewritten pages, including footnotes and bibliography. Upon completion of the M.A. requirements, students will be reviewed by the faculty to determine whether they are making satisfactory progress and should continue in the program.

Students should carefully plan their courses so as to be ready, normally after six semesters, to concentrate on reading for their Ph.D. oral qualifying examinations (which should be taken in the seventh or eighth semester). Students may enroll in courses beyond the 10-course minimum and audit courses with the permission of instructors. Students may use a limited number of lower division and independent studies courses to satisfy the graduate degree requirements. The academic advisers must approve the choice of courses during the program. The academic advisers will prepare a plan of study for the student in consultation with one or more faculty members of the department. (F)

Students are eligible to take required courses for letter grades and must approve the choice of courses during the program requirements. The academic advisers will prepare a plan of study for the student in consultation with one or more faculty members of the department. (F)

South and Southeast Asian

Lower Division Courses

1A-1B. Elementary Telugu. (4-4) Four hours of lecture and two hours of laboratory per week. Prerequisites: 1A is prerequisite to 1B. The focus of this course will be on systematic grammar, essential vocabulary, and reading comprehension. Students are expected to complete the requirements within two years. For more detailed information about the Ph.D., visit the department website at ls.berkeley.edu/dept/sseas/programs/graduate_program.html.

R5A. Self, Representation, and Nation. (4) Three hours of lecture and one hour of discussion per week. Formerly 5A. This course is devoted to a study of selected literary texts set in various regions of South Asia. The readings will include works by foreign authors who lived and traveled in Southeast Asia and translations of works by Southeast Asian writers. These texts will be used to make comparisons and observations with which to characterize colonialism, nationalism, and postcoloniality. This course satisfies the first half of the Reading and Composition requirement. (F,SP) Sunkari

R5B. Under Western Eyes. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 5A or course equivalent to 1A. Formerly 58. In this course, the student will read selections from the large body of scholarly texts that have been written about Southeast Asia. Expository and argumentative essays by practitioners like Stanford Raffles, Margaret Mead, Clifford Geertz, and Benedict Anderson will be examined. Discussions will cover a broad range of theoretical issues including power, gender, and identity. This course satisfies the second half of the Reading and Composition requirement. (SP)

39. Freshman/Sophomore Seminar. Course may be repeated for credit as topic varies. One hour of seminar per week per unit. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Freshman and sophomore seminars offer lower division students the opportunity to explore an interdisciplinary or graduate level course with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and semester to semester but are limited by the faculty, but the suggested limit is 25. (F,SP)

C51. Introductory Topics in Religious Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Selected introductory topics in the study of religion. Also listed as Religious Studies C51. (F,SP)

C52. Introduction to the Study of Buddhism. (4) Three hours of lecture and one hour of discussion per week. This introduction to the study of Buddhism will consider materials drawn from various Buddhist traditions of Asia from ancient times down to the present day. However, the course is not intended to be a comprehensive or systematic survey; rather than aiming at breadth, the course is designed around key themes such as ritual, image veneration, mysticism, meditation, and death. The overarching emphasis throughout the course will be on the hermeneutic difficulties attendant upon the study of religion in general, and Buddhism in particular. Also listed as Religious Studies C52. (F,SP) Staff

84. Sophomore Seminar. (1,2) Course may be repeated for credit as topic varies. One hour of seminar per week for 15 units. One and one-half hours per week in the second semester. Two hours of seminar per week per unit for eight weeks. Three hours of seminar per week per unit for five weeks. Sections 1-2 to be graded on a passed/not passed basis. Sections 3-4 to be graded on a letter-grade basis. Prerequisites: Consent of instructor. (F,SP) Staff

95. Directed Group Study for Lower Division Students. Course may be repeated for credit. One to four hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. 4-unit limit per term. (F,SP) Staff

98A. South Asian Studies. (1-4)

99. Supervised Independent Study and Research for Lower Division Students. Course may be repeated for credit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. 4-unit limit per term. (F,SP) Staff

99A. South Asian Studies. (1-4)

Upper Division Courses

100A-100B. Filipino. (5) (F,SP) Staff

120. Topics in South and Southeast Asian Studies. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Designed to permit regular faculty and visiting scholars to explore topics not normally covered in the curriculum. Focus and readings will change in response to current research interests of instructors and teaching needs of the department. (F,SP) Staff

C135. Tantric Traditions of Asia. (4) Three hours of lecture per week. Prerequisites: One course in Buddhist Studies; or consent of instructor. The emergence of the tantras in seventh- and eighth-century India marked a watershed for religious practice throughout Asia. These esoteric texts introduced complex new ritual technologies that transformed the religious traditions of India from Brahmanism to Jainism and Buddhism, as well as those of Southeast Asia, Tibet, and Korea. This course provides an overview of tantric religion across these...
regions. Also listed as East Asian Languages and
Cultures C125 and Group in Buddhist Studies C135. 
(F,SP) Staff

194. Methods in South and Southeast Asian Studi-
es. (4) Course may be repeated for credit. 
Three hours of lecture and one hour of discussion per week. 
Formerly 294A. Introduction to the principal, 
historical, and contemporary methods for studying the liter-
atures, languages, religions, cultures, and peoples of 
Southeast and South Asia. Discussion of the disci-
plinary orientations of Orientalism, philology, anthro-
pology, comparative religions, gender studies, and 
history. Topics and readings change year to year. 
Seminar work will culminate in a one-day student sym-
posium. (F,SP) Staff

299. Dissertation Preparation and Related Re-
search. Course may be repeated for credit. Must 
be taken on a satisfactory/unsatisfactory basis. 
Prerequisites: Advanced candidate with consent of thesis 
supervisor and graduate adviser. Normally reserved for 
students directly engaged in writing the doctoral dis-
sertation. (F,SP) Staff

601. Individual Study for Masters Students. Course 
may be repeated for credit. Course does not satisfy 
unit or residence requirements for master’s degree. 
Must be taken on a satisfactory/unsatisfactory basis. 
Prerequisites: For master’s degree candidates, 
individual study for the comprehensive or language 
requirements in consultation with the graduate ad-
dvisor. (F,SP) Staff

R5A. Great Books of India. (4) Three hours of 
lecture and one hour of discussion per week. Formerly 5A. 
Reading and composition based on 10 classic works 
of Indian literature ranging from the ancient Sanskrit 
epics to modern novels by Indian and Western 
authors. Weekly composition on texts and topics read 
and discussed in class. Satisfies the first half of the 
Reading and Composition requirement. (F) Staff

R5B. India in the Writer’s Eye. (4) Three hours of 
lecture and one hour of discussion per week. For-
merly 5B. Reading and composition in connection 
with eastern and western representations of India, 
and Indian and modern Indian literature. Satisfies the 
second half of the Reading and Composition requirement. (SP) Staff

108. Psychology and Traditional India. (3) Three 
hours of lecture per week. Prerequisites: South Asian 1A. 
Psychology 1, or permission of instructor. Lec-
tures and discussion of psychological and psycho-
analytic approaches to some of the cultural, 
familial, and social aspects of ancient and traditional 
India. Readings in translation and important sec-
ondary works on the psychology of Indian culture, and 
selected works from the psychoanalytic literature. (SP) 
R.P. Goldman

C114. Tibetan Buddhism. (4) Three hours of lecture 
per week. This course is a broad introduction to the 
history, doctrine, and culture of the Buddhism of Tibet. 
We will begin with the introduction of Buddhism to 
Tibet in the eighth century and move on to the pu-

South Asian

Lower Division Courses

101A. Introduction to the Civilization of Early India. 
(4) Three hours of lecture per week. This course offers 
a broad historical and cultural survey of the civilizations 
of the Indian subcontinent from the earliest period 
known to archaeology to the advent of Islam as a 
major cultural and political force around the 13th cen-
tury CE. Attention will be paid to the geography and 
ethnography of the region, its political history, and 
the religious, philosophical, literary, scientific, 
and artistic movements that have shaped it and contributed to 
its development as a unique, diverse, and fasci-
nating world civilization. Lectures, readings, and class 
discussions will center on salient texts, broadly defined, 
that have characterized major cultural, religious, 
and political formations from the earliest antiquity to the 
late medieval period. This course is open to all inter-
ested students and is required for those majoring or 
minoring in South Asian Studies. (F) Staff

101B. Introduction to the Civilization of Medieval 
and Modern India. (4) Three hours of lecture per 
week. This course offers a broad historical and cul-
tural survey of the civilizations of the Indian subconti-
nent from the 12th century to partition of India in 1947. 
Attention will be paid to the geography and ethnog-
graphy of the region, its political history, and the reli-
gious, philosophical, literary, and artistic movements 
that have shaped it and contributed to its develop-
ment as a unique, diverse, and fascinating world civ-
ilization. Lectures, readings, and class discussions 
will center on salient texts, broadly defined that have 
characterized major cultural, religious, and political 
formations from the medieval period to the 20th cen-
tury. This course is open to all interested students 
and is required for those majoring orminoring in South 
Asian studies. (SP) Staff

105. Cultural Survey of South and 
Southwest Asia. (3) Three hours of 
lecture and one hour of discussion per week. 
Prerequisites: Consent of instructor. 
Formerly South Asia 250. Topics vary from semester 
september to semester. Staff

Graduates

250. Seminar in South and Southwestern Asia. 
(4) Three hours of seminar and one hour of dis-
cussion per week. Prerequisites: Consent of instructor. 
Formerly South Asia 250. Topics vary from semester 
september to semester. Staff
tion of the major schools of Tibetan Buddhism, Tibetan Buddhist literature, ritual and monastic practice, the place of Buddhism in Tibetan political history, and the contemporary role of Tibetan Buddhism inside and outside of Tibet. Also listed as Group in Buddhist Studies C114 and Tibetan C114. (F.SP) Staff

121. Classical Indian Literature in Translation. (4) Three hours of lecture and one hour of discussion per week. Literary works of ancient India are read in English translation, studied critically, and their purpose is to give a comprehensive picture of many important areas of the Indian literary heritage. (F,SP)

123. Religion in Medieval India. (4) Three hours of lecture and one hour of discussion per week. This course introduces students to the thematic approach to the study of religion in medieval India. It will cover the period from 600 to 1600 A.D.—a time of significant developments in both Hinduism and Islam on the subcontinent. Besides witnessing tremendous religious ferment in the South and the emergence of popular devotional movements within Hinduism in the North, the period also observed new mystical and regional articulations of Islam. Also listed as Religious Studies C164, (F,SP) Dalma, Faruqui.

Modern Indian Literature. (4) Three hours of lecture and one hour of discussion per week. Lectures and discussion of 19th- and 20th-century Indian literature through English translations and original works will provide an introduction to the literature of contemporary Indian society and culture through literature. (F,SP) Staff

127. Religion in Early India. (4) Three hours of lecture per week. Designed as a two-semester sequence, these courses are an introduction to the religions that have their origin on the Indian subcontinent—Hinduism, Buddhism, Jainism, Sikhism, and tribal religions—as well as those that originated in other regions such as Islam, Christianity, Judaism, and Zoroastrianism. Organizing this material chronologically rather than by religion allows us to see the connections between religious traditions that facilitate comparisons and promotes an understanding not only of the differences among these religions but also some of their commonalities in philosophy, theology, and practice. Also listed as Religious Studies C161, (F,SP) Staff

128. Religious Movements in Modern India. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: 127 or Religious Studies 161 or consent of instructor. Formerly 128. Introduces history of religious movements in modern India. Examines the dissemination and reinterpretation of sacred texts and religious practices. Includes a reading of spiritual experience and religious authority at mid-century in an influential modern novel. Examines religious conversions, transformations of women's roles, and how the concept of a secular state in post-independence India shapes religious policy and practice. Also listed as Religious Studies C165. (F,SP) Goldman

141. Religion in South India. (3) Three hours of lectures and one hour of discussion per week. The development and practice of religion in South India. Emphasis will be on sources translated directly from Indian languages. Listed as Religious Studies C154. (F,SP) Goldman

144. Islam in South Asia. (4) Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. The aim of this course is to understand the role of Islam in South Asia. The course will also examine the role of Islam in South Asia's Muslim communities and institutions and religious movements in South Asia is to introduce students to the broad historical currents of the expansion of Islam in the Indian subcontinent; the role of Muslim political power in the formation of different communities; the way Islam has contributed to material culture; the ways the roles of Islam in colonial and the contemporary concerns of South Asian Muslims. While this is a lecture course, ample time will be set aside for discussion and the active engagement of participants will be expected. Lectures will be supplemented with visual material, music, and movies where possible. (F,SP) Staff

146. Mughal India Through Memoirs, Chronicles, and Other Texts. (4) Three hours of lecture and one hour of discussion per week. This course is designed to provide a dual chronological and thematic approach to the study of one of the greatest empires in human civilization: the Mughal Empire. Although the bulk of this course will focus on the Mughal Empire during its heyday between the 1550s and the early 1700s, we will also examine the distinctive historical and geographical contexts that both enabled the emergence and, ultimately, the decentralization of Mughal power. In so doing, this course will not only study South Asia but also the rest of the world. Simultaneously, this course will also pay particular attention to a series of common misconceptions that dog the study of pre-modern Islamic politics. Among them, the supposedly lesser role played by women in politics; the dogmatic and central role of the “Muslim” states; and the economic and political superiority of Western Europe. Crucial to these questions also is an examination of the historiography and historiographical traditions that have come to dominate the understanding of the Mughal Empire. (F,SP) Faruqui

148. Religious Nationalism in South Asia. (4) Three hours of lecture and one hour of discussion per week. This course seeks to interrogate the highly contentious and controversial issue of Hindu and Muslim religious nationalism (otherwise known as “communism”) in South Asia. In so doing, we will interrogate the historical trajectory and development of religious nationalism from the colonial period through to the present. We will examine and analyze the role of (some) religious nationalism outside of South Asia; Hindu and Muslim relations in the pre-colonial period; colonial attempts to construct South Asia’s past along religious and communal lines; the growth of early Hindu and Muslim religious nationalism; the interplay between secular and religious nationalism; different intellectual attempts to articulate notions of bounded religious communities; the success of religious nationalism in contemporary South Asia; and the implications of religious nationalism for the future of South Asia. (F,SP) Faruqui

152. Literature, Nation, and Film: South Asian Trajectories. (4) Three hours of lecture and one hour of laboratory per week. This seminar reviews the evolution of the various literary constructions of the experience of modernity in the 20th-century India, with a particular focus on the imaginary of the nation. Students will read seminal literary works by such authors as Anand, Mahasweta Devi, Home and the World, and Tagge. Course will include readings that consider issues of identity, historical consciousness, nationhood, and modernity in South Asia from different perspectives. We will watch a wide selection of films, beginning with the silent era and the early sound period, and then move on to the “golden age” of Indian cinema in the 1950s and 1960s, finishing with films from more recent years, but may not be limited to, North India. The class will provide an advanced level exposure to South Asian cultural history and theory, with special reference to modern literature and film. (F,SP) Kapse

154. Death, Dreams, and Visions in Tibetan Bud- dhism. (4) Three hours of lecture per week. Tibetan Buddhists view the moment of death as a rare opportu- nity to attain Nirvana. This course examines how Tibetans have used death and dying in the path to enlightenment. Readings will address how Tibetan funerary rituals work to assist the dying toward this end. This class will also explore the crucial moment through tantric meditation, imaginative rehearsals, and explorations of the dream state. Also listed as Tibetan C154 and Group in Buddhist Studies C154. (F,SP) Dalton

Graduate Courses

215A-215B. Readings in Indian Buddhist Texts. (2,4-4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Consent of instructor. This seminar is designed for reading a wide spectrum of Indian Buddhist texts in the Sanskrit (or Pali) original introducing the students to different genres, and different aspects of Indian Buddhism. The students taking the course for 2 units (rather than 4) will be expected to prepare thoroughly every week for the reading of Buddhist texts in the original. They will also be expected to read all related secondary literature that is assigned to support the study of the primary source material. In contrast to the students taking the course for 4 units, they will not be expected to write a term paper or to prepare special presentations for class. Also listed as Group in Bud- dhist Studies C215A. (F,SP) Rospatt

215B. Readings in Indian Buddhist Texts. (2-4) Course may be repeated for credit. Three hours of seminar per week. Prerequisites: Consent of instruc- tor. This graduate seminar is designed for reading a wide spectrum of Indian Buddhist texts in the Sanskrit (or Pali) original introducing the students to different genres, and different aspects of Indian Buddhism. The students taking the course for 2 units (rather than 4) will be expected to prepare thoroughly every week for the reading of Buddhist texts in the original. They will also be expected to read all related secondary literature that is assigned to support the study of the primary source material. In contrast to the students taking the course for 4 units, they will not be expected to write a term paper or to prepare special presentations for class. Also listed as Group in Bud- dhist Studies C215B. (F,SP) Rospatt

224. Readings in Tibetan Buddhist Texts. (2,4) Three hours of seminar per week. This graduate seminar provides an introduction to a broad range of Tibetan Buddhist texts as well as to the methods and approaches used to study them. The approach of the course will be drawn from a variety of genres and historical peri- ods, including: (1) chronicles and histories, (2) biogra- phical literature, (3) doctrinal treatises, (4) canonical literature, (5) ritual manuals, (6) pilgrimage guides, and (7) liturgical texts. The seminar is designed to be of interest to graduate students interested in premodern Tibetan from any perspective (literature, religion, art, history, philosophy, law, etc.). Students are required to participate in all of the readings in the original classical Tibetan. The course will also introduce students to “tools and methods” for the study of Tibetan Buddhist literature, including standard lexical and bibliographic references, digital resources, and secondary literature in modern languages. The content of the course will vary

B prefix=language course for business majors
C prefix=cross-listed course
H prefix=honors course
R prefix=course satisfies R&RC requirement
AC suffix=course satisfies American Cultures requirement
W prefix=online course
*Professor of the Graduate School
+Recipient of Distinguished Teaching Award
Southeast Asian

Lower Division Courses

10A-10B. Introduction to the Civilization of Southeast Asia. (4,4) Three hours of lecture and one hour of discussion per week. Readings, lectures, and discussions of the culture and civilization of Southeast Asia.

A. Mainland Southeast Asia: Covers the modern-day nations of Burma, Cambodia, Thailand, etc., with special emphasis on the impact of Hinduism and Buddhism. (F,SP) Staff

B. Insular Southeast Asia: Covers the modern-day nations of Indonesia, Malaysia, and the Philippines. Special emphasis on the arts and their social and political context, with discussions on the impact of the colonial experience and the question of modernization versus tradition. (F,SP) Tiwon

Upper Division Courses

128. Introduction to Modern Indonesian and Malaysian Literature in Translation. (4) Three hours of lecture and one hour of discussion per week. This course will examine the role of contemporary literature in Indonesian/Malaysian society. Emphasis on the socio-political aspects of this literature in historical context. Prerequisites: Upper division standing or consent of instructor. (F) Staff

129. Mainland Southeast Asian Literature. (4) Three hours of lecture per week. Prerequisites: Upper division standing or consent of instructor. Readings and lectures focus on Thailand, Vietnam and Burma; Cambodian and Lao texts, if available. After a brief attention to the influence of oral tradition, classic poetry, and dance drama, emphasis will be on modern novels, short stories, film, and television in their cultural/historical context. (F,SP)

130. Articulations of the Female in Indonesia. (4) Three hours of lecture per week. This course examines the impact of the history of literacy and literature upon the ways in which perceptions and roles of women are constructed and reinforced in a developing non-Western society. Course material includes literature, oral and manuscript narratives, ritual performance. (F) Tiwon

137. Islam and Society in Southeast Asia. (4) Three hours of seminar/discussion/laboratory/field trips/videos per week. This undergraduate seminar will be an investigation into key discourses on Islam in Southeast Asia, focusing on history, literature, and culture. We will trace the processes through which Islam entered the Malay world in the 13th century, and explore the European colonial encounters with Islam in Southeast Asia and the ways that Islam interacted with and resisted colonialism. We will discuss the role of mysticism and of reformists and will also explore the struggles of Islam as a minority religion in the Philippines and Thailand. Readings will include primary sources in translation, literary texts, ethnographic works, and writings by colonial and local scholars. (F) Hadler

138. Southeast Asian Cultures, Texts, and Politics. (4) Four hours of seminar, two hours of lecture, and four hours of reading/writing per week. Prerequisites: Southeast Asian 10B or consent of instructor. This seminar will focus on the late colonial and national periods in Southeast Asia. Through literary and political texts as well as classical anthropological sources, we will explore different approaches to reading and analyzing Southeast Asian source material. There will be extensive readings of works of fiction and primary source material in translation, as well as occasional screenings of films. We will tackle broader themes and theoretical approaches to Southeast Asian sources and literatures and will discuss different approaches to reading modern Southeast Asian texts. The course is open to advanced undergraduates and graduate students. (F,SP) Hadler

C141B. Modern Southeast Asia. (4) Three hours of lecture and one hour of discussion per week. Major themes in modern history will be examined during cross-country comparisons involving the region’s largest and most populous countries: Thailand, Burma, Vietnam, Indonesia, and the Philippines. Also listed as History C138. (F,SP) Staff

C164. The Indonesian Connection: Dutch Literature About the Indies in English Translation. (4) Three hours of lecture and one hour of discussion per week. In postcolonial thought on European claims to cultural supremacy, the case of the “Dutch East-Indies” (the future Indonesia) still arouses questions like: What made the Dutch colonial policy different from that of other European powers? What were the main characteristics of the “Dutch East-Indies”? How did a small country like the Netherlands manage to rule a territory that was 52 times its own in scale? And how can we explain that 350 years of Dutch domination left so few traces in contemporary Indonesia? Also listed as Dutch C116. (F,SP) Staff

Bengali

Lower Division Courses

1A-1B. Introductory Bengali. (5,5) One and one-half hours of lecture and two and one-half hours of reading/writing per week. Prerequisites: 1A is prerequisite to 1B or consent of instructor. Students will be expected to acquire knowledge of the basic grammar of Bengali, such that they learn to read simple graded texts and to speak at the low-intermediate level by the end of the year. (F,SP) Staff

Upper Division Courses

101A-101B. Intermediate Bengali. (5,5) Five hours of seminar per week. Prerequisites: 1B is prerequisite to 101A; 101A is prerequisite to 101B; or consent of instructor. Students are expected to be able to read, with the aid of a dictionary, modern Bengali literature, and speak at a high-intermediate level by the end of the year. There will be viewing of Bengali videos at a mutually agreed upon time and in class from time to time. (F,SP) Staff

Filipino

Lower Division Courses

1A-1B. Introductory Filipino. (5,5) Five hours of lecture per week. Prerequisites: 1A is prerequisite to 1B. Formerly Tagalog 1A. A systematic introduction to the grammar, sentence patterns, and essential vocabulary of modern standard Filipino. Emphasis is placed on extensive practice in idiomatic Filipino conversation, with additional practice in reading and writing Filipino. (F,SP) Barrios-Leblanc

Upper Division Courses

100A-100B. Intermediate Filipino. (5,5) Five hours of lecture per week. Prerequisites: 1A-1B. Formerly Tagalog 100A-100B. The goal of this course is to enable students to increase their proficiency in Filipino to at least the intermediate-high level of the national ACTFL Proficiency Guidelines. While speaking and listening comprehension will be stressed, training in reading and writing Filipino will be an integral part of instruction. Films and video/audio materials will supplement written texts. (F,SP) Barrios-Leblanc

101A-101B. Advanced Filipino. (3,3) Course may be repeated for credit. Three hours of lecture/discussion per week. Prerequisites: 100A-100B or equivalent, or consent of instructor. Students will discuss essays on language, literature, and Philippine society, and literary texts. Topics include language and the nation; poetry and discourse; language and ideology; and “pananalinghaga” (tropes/metaphors) in under- standing society. The students choose whether they would like to go on a creative (poetry, fiction) or a research track (essay). (F,SP) Barrios-Leblanc

Hindi-Urdu

Lower Division Courses

1A-1B. Introductory Hindi. (5,5) Five hours of lecture and one hour of laboratory per week. Hindi writing systems. Survey of grammar. Graded exercises and readings drawn from Hindi literature, leading to mastery of grammatical structures and essential vocabulary and achievement of basic reading and writing competence. (F,SP) Jain

2A-2B. Introductory Urdu. (5,5) Five hours of lecture and one hour of laboratory per week. The course concentrates on developing skills in reading, writing, speaking, and aural comprehension. Evaluation is based on attendance, written homework assignments, quizzes, dictations, and examinations. Conventional teaching materials may be supplemented by popular songs and clips from contemporary Indian cinema. (F,SP) Staff

Upper Division Courses

100A-100B. Intermediate Hindi. (4,4) Three hours of lecture and laboratory work/vsuals per week. Prerequisites: 1A-1B. This course acquaints students with representative readings from Hindi texts on pivotal cultural issues from a wide variety of sources, to enable them to acquire cultural competence in the language. Systematic training in advanced grammar and syntax, reinforced by exercises in composition, both oral and written. Special attention to developing communication skills. (F,SP) Jain

101A-101B. Readings in Modern Hindi. (3,3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: Two years of Hindi or consent of instructor. This course is designed for students who have already achieved an intermediate level of proficiency in speaking, reading, and writing Hindi. Its objective is to move students toward a greater level of fluency in each of these key areas. Students will be introduced to a variety of contemporary literary genres. Weekly readings and discussions will be on short stories, poems, and dramatic sketches from representative authors. These readings focus on various social, cultural, political, and historical aspects of Indian society. Students are encouraged to make notes in their written assignments as well as in their class discussions. Written assignments on themes suggested by the reading will be required. We will also work with advanced grammatical structures of the language. Articulated in matters of style and idiom. The class will be conducted entirely in Hindi and students will acquire language skills sufficient to approach literary texts on their own. (F,SP) Jain

103A-103B. Intermediate Urdu. (4,4) Three hours of lecture/laboratory per week. Prerequisites: Successful completion of Urdu 2A-2B. Introduces various types of written and spoken Urdu; vocabulary building, idioms, and problems of syntax; and conversations. Reading of selected fiction and nonfiction in modern Urdu, including fables, short stories, and poetry. Exercises in grammar, conversation, and composition. (F,SP) Staff

104A-104B. Advanced Urdu. (3,3) Three hours of lecture per week. Prerequisites: Two years of Urdu or consent of instructor. Reading of Urdu prose and poetry in a variety of literary and scholarly styles; composition. Topics in advanced grammar; designed to improve proficiency in speaking, listening, reading, and writing. Students will be expected to converse in a clearly participatory fashion, initiate, sustain, and bring to closure a wide variety of communicative tasks using diverse language strategies. (F,SP) Staff
211. Hindi Literature. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: Two years of Hindi or equivalent. The course will focus on readings in modern Hindi literature. History, drama and critical essays will be read, in addition to ancient and historical literature, particularly also on the medieval devotional literature in Hindi. Topics will vary from year to year. Students will be expected to write a 20-25 page research paper.

Dalmia

Khemr

1A. Introductory Khmer. (5) Five hours of lecture per week. Provides a command of the basic structures of standard spoken Cambodian and tools for reading and writing elementary texts. Through use of computer-based materials, a textbook, and communicative practice, students gain a foundation in "survival" spoken Khmer. This involves memorization of question and answer exchanges in Khmer which students are likely to encounter in modern Cambodian. Topics include greetings, speaking to teachers and elders and discussing language learning, talking about family and personal history, and food. Students learn the basic elements of Khmer script and important sights-words, and to read and write simple sentences on everyday topics. Intended for non-native speakers of Khmer with no oral or aural comprehension in the language. Students gain basic behavioral skills and courtesies necessary for smooth interaction in Khmer society and culture. (F,SP) Smith, F.

1B. Introductory Khmer. (5) Five hours of lecture per week. Prerequisites: 1A or equivalent. Students complete their study of everyday standard Khmer to a "survival" level. While the memorization of vocabulary and common personal exchanges practiced in 1A will make up the majority of the material studied, students will have some opportunity to learn to improvise and practice formal and informal everyday Khmer. Topics include transportation and directions, the world of work, religion, health, and conducting daily life in Cambodia. Students learn to read simple authentic texts such as folk tales, personal letters, forms, and roadside signs. Students continue their study of culturally appropriate behavior in the context of Khmer culture, including notions of "saving face" and maintaining social harmony, and how these are expressed in both spoken language and in one's actions. (F,SP) Smith, F.

Upper Division Courses

100A. Intermediate Khmer. (5) Five hours of lecture per week. Prerequisites: 1A-1B or equivalent, or home exposure to Khmer. Non-native speakers who have completed Beginning Khmer will build spoken proficiency with emphasis on everyday "storytelling" and the expression of emotions, feelings, and opinions. Students will gain experience reading progressively difficult authentic Khmer texts, including folk tales and newspaper articles. Native speakers with family exposure to Khmer will be introduced to the writing system. They will quickly "catch up" with non-native classmates who have studied the writing system before. All students will study important patterns and structures in Khmer grammar and morphology, and gain a foundation in formal spoken Khmer, express opinions and positions, form arguments, and learn to discuss a variety of topics with educated native speakers, and read more advanced texts dealing with these topics than the intermediate students. Additional material beyond the intermediate course will focus on the same broad topics covered in Intermediate Khmer—religion, traditional culture, and the language of public information (news and advertising)—but they will learn more advanced vocabulary and grammatical structures necessary for the discussion of these topics with educated native speakers, and read more advanced texts dealing with these topics than the intermediate students. (F,SP) Smith, F.

101A. Advanced Khmer. (3) Three hours of lecture per week. Prerequisites: Two years of Khmer or consent of instructor. This course continues the themes and goals of the preceding one, and the same broad topics covered in Intermediate Khmer—religion, traditional culture, and the language of public information (news and advertising)—but they will learn more advanced vocabulary and grammatical structures necessary for the discussion of these topics with educated native speakers, and read more advanced texts dealing with these topics than the intermediate students. Additional material beyond the intermediate course will focus on the same broad topics covered in Intermediate Khmer—religion, traditional culture, and the language of public information (news and advertising)—but they will learn more advanced vocabulary and grammatical structures necessary for the discussion of these topics with educated native speakers, and read more advanced texts dealing with these topics than the intermediate students. (F,SP) Smith, F.

101B. Advanced Khmer. (3) Three hours of lecture per week. Prerequisites: Two years of Khmer or consent of instructor. Students will read advanced texts dealing with the topics of politics and history. They will also gain mastery of advanced structural and narrative texts, and read, discuss, and undertake group projects based on a variety of modern Khmer short stories. As in the case with Intermediate Khmer, students will undertake substantial independent study, culminating in a final oral presentation. However, the standard by which both written and oral material will be judged will be much higher for advanced students. Special attention will be paid to formal speaking style and advanced grammatical structures in Khmer for all students, and colloquial spoken expression for non-native speakers. (F,SP) Smith, F.

Malay/Indonesian

Lower Division Courses

1A-1B. Introductory Indonesian. (5) Five hours of lecture and one hour of laboratory per week. Survey of grammar, graded exercises, and readings drawn from Indonesian texts, leading to a mastery of basic language patterns, essential vocabulary, and to achievement of basic reading, writing, and conversational competence. Emphasis on developing communicative skills. (F,SP) Lunde

Upper Division Courses

100A-100B. Intermediate Indonesian. (5;5) Five hours of lecture and one hour of laboratory per week. Prerequisites: 1A-1B. Readings in Indonesian texts, including newspapers, journals, and literature exploring a variety of styles. Systematic study of grammatical and lexical problems arising from these readings. Advanced exercises in composition, oral and written communicative skills, and cultural competence. (F,SP) Lunde

Graduate Courses

210A-210B. Seminar in Malay Letters and Oral Traditions. (4;4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Formerly 200, 201 and 202. Advanced readings in Sanskrit literature, including Sanskrit orator prose with emphasis on the canons of poetic analysis of the Indian aesthetic tradition. (FSP) R.P. Goldman

206. Middle Indic. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion. Prerequisites: 101B or equivalent. Readings from the Rig-Veda and other Vedic texts, including Brahmanas and Upanishads. Knowledge of German and/or French is recommended. Staff

207. Middle Indic. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion. Prerequisites: 101B or equivalent. Readings from the Rig-Veda and other Vedic texts, including Brahmanas and Upanishads. Knowledge of German and/or French is recommended. Staff

208. Sanskrit Philosophical Texts. (4) Course may be repeated for credit. Three hours of seminar and one hour of discussion per week. Prerequisites: Two years of Sanskrit or equivalent. Reading of a Sanskrit philosophical, logical, or grammatical text, with attention to philosophical, logical, or grammatical features. Text to be chosen in consultation with students. Staff

Punjabi

Lower Division Courses

1A-1B. Introductory Punjabi. (5) Three hours of lecture and two hours of laboratory per week. Prerequisites: 1A is prerequisite to 1B. Survey of grammar. Graded exercises, leading to a mastery of basic language patterns, essential vocabulary, and achievement of basic reading and writing skills. (F,SP) Ubi, Upkar

Upper Division Courses

100A-100B. Intermediate Punjabi. (5;5) Course may be repeated for credit. Three hours of lecture and two hours of laboratory per week. Prerequisites: 1B is prerequisite to 100A; 100A is prerequisite to 100B. Focus on reading, writing, and achievement of Punjabi more fluently in formal and informal contexts. Selected readings vary every semester. These form the starting point to stimulate students’ own writings which include a long interview with a Punjabi elder from the wider community. These may be recorded in the students’ own voices and form a contribution to the ongoing “Punjabi Voices” project. Review of grammar provided as needed in addition to the introduction of more complex grammatical structures. Grading based on performance in class and final presentation, weekly quizzes, two midterms, and a final. (F,SP) Ubi, Upkar

Sanskrit

Upper Division Courses

100A-100B. Elementary Sanskrit. (5;5) Five hours of lecture and one hour of laboratory per week. Elements of Sanskrit grammar and practice in reading Sanskrit texts. (F,SP) S. Goldman

101A-101B. Intermediate Sanskrit. (5;5) Course may be repeated for credit. Four and one-half hours of lecture per week. Prerequisites: 100A. 101B may be taken before 101A with consent of instructor. Selected readings readings vary each semester. In addition, students are required to memorize verses, read selected secondary scholarship, and lead an in-class discussion. Grammar and vocabulary of the review will be provided as necessary. Grading is based on class performance, mid-term, final, and translation project.

A. Epic Sanskrit: Course readings focus on Epic Sanskrit and commentary. Selections are taken from Valmiki Ramayana and Mahabharata.

B. Kayva and Sastra: Course readings focus on Kayva and/or Sastra. (F,SP) S. Goldman

Graduate Courses

200A-200B. Sanskrit Literature. (4;4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Formerly 200, 201 and 202. Advanced readings in Sanskrit literature, including Sanskrit orator prose with emphasis on the canons of poetic analysis of the Indian aesthetic tradition. (FSP) R.P. Goldman

203. Vedic Sanskrit. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Readings from the Rig-Veda and other Vedic texts, including Brahmanas and Upanishads. Knowledge of German and/or French is recommended. Staff

206. Middle Indic. (4) Course may be repeated for credit. Three hours of lecture and one hour of discussion per week. Prerequisites: 101B or equivalent. Readings from the Rig-Veda and other Vedic texts, including Brahmanas and Upanishads. Knowledge of German and/or French is recommended. Staff

207. Sanskrit Philosophical Texts. (4) Course may be repeated for credit. Three hours of seminar and one hour of discussion per week. Prerequisites: Two years of Sanskrit or equivalent. Reading of a Sanskrit philosophical, logical, or grammatical text, with attention to philosophical, logical, or grammatical features. Text to be chosen in consultation with students. Staff
Tagalog

Lower Division Courses

1A-1B. Introductory Tagalog. (5,5) Five hours of lecture and one to two hours of discussion per week. Prerequisites: 1A or equivalent or consent of instructor; 100A or consent of instructor is a prerequisite for 1B. Formerly Tagalog 1A. A systematic introduction to the grammar, sentence patterns, and essential vocabulary of modern standard Tagalog. Emphasis is placed on extensive practice in idiomatic Tagalog conversation, with additional practice in reading and writing Tagalog. (F,SP) Staff

Upper Division Courses

100A-100B. Intermediate Tagalog. (5,5) Five hours of lecture and one to two hours of discussion per week. Prerequisites: 1A-1B, or consent of instructor; 100A or consent of instructor is a prerequisite for 100B. Formerly Tagalog 100A. The goal of this course is to enable students to increase their proficiency in Tagalog to at least the intermediate-high level of the national ACTFL Proficiency Guidelines. While speaking and listening comprehension will be stressed, training in reading and writing Tagalog will be an integral part of instruction. Films and video/audio materials will supplement written texts. (F,SP) Staff

Tamil

Lower Division Courses

1A-1B. Introductory Tamil. (5,5) Five hours of lecture per week. The grammar of modern Tamil will be covered followed by readings in simple texts. Practice will also be given in spoken Tamil. (F,SP) K. Hart

Upper Division Courses

101A-101B. Readings in Tamil. (4,4) Three hours of lecture and one hour of discussion per week. Prerequisites: one year of Tamil or consent of instructor. These courses introduce students to a variety of literary styles. 101A will consist of weekly readings and discussions of short stories, poems, and dramatic sketches from representative authors. Short written assignments on themes suggested by the readings are required. Special attention is paid to matters of style and idiom. 101B is devoted to viewing films based on a variety of themes (social, village, mythological, classical Tamil) and to reading scripts and short fiction in Tamil. (F,SP) K. Hart

Graduate Courses

210A-210B. Seminar in Tamil Literature. (4,4) Course may be repeated for credit with consent of instructor. Three hours of seminar and one hour of discussion per week. Prerequisites: 100B. Readings in advanced Tamil. Texts to be determined by the needs of the student. (F,SP) K. Hart

Telugu

Lower Division Courses

1A-1B. Elementary Telugu. (4,4) Four hours of lecture and two hours of laboratory per week. Prerequisites: 1A is prerequisite to 1B. The focus of this course will be on systematic grammar, essential vocabulary and conversations. The goal is to achieve basic reading, writing, and conversational competence as well as exposure to Telugu culture and traditions through language learning. Students will be able to read short stories by the end of this course with some facility. (F,SP) Sunkari

Thai

Lower Division Courses

1A. Introduction to Thai. (5) Five hours of lecture per week. Introduction to reading, writing, and speaking Thai. Open to anyone who does not know how to read Thai. (Non-reading Thai speakers may take 1A.) Materials include a course reader and Thai films with English subtitles. (F,SP)

18. Introduction to Thai. (4) Five hours of lecture per week. Prerequisites: 1A. A continuation of 1A. Students who speak Thai and have a limited reading ability may be eligible for this course with the consent of the instructor. Materials include a textbook, supplementary materials, and Thai films. (F,SP)

Upper Division Courses

100A. Intermediate Thai. (5) Five hours of lecture per week. Prerequisites: 1B or consent of instructor for students who have not passed 1B. Students must be able to speak, read, and write Thai at an elementary level. Materials include textbook, supplementary materials, and short essays in Thai. (F,SP)

100B. Intermediate Thai. (5) Five hours of lecture per week. Prerequisites: 100A or consent of instructor for students who have not passed 100A. Materials include textbook, supplementary materials, short essays, and short fiction in Thai. (F,SP)

101A-101B. Advanced Thai. (3,3) Three hours of reading and discussion per week. Prerequisites: 100A. This three-year Thai course will focus on literature written between 1855 and 1955. Readings will be in Thai, with supporting essays in English, providing social/political context. Emphasizes on evolution of modern Thai society, overthrow of the absolute monarchy in 1932, development of literatures of social preservation and of social consciousness. Thai readings consist of short stories, novel excerpts, correspondence. (F,SP) Keppner

Vietnamese

Lower Division Courses

1A-1B. Introductory Vietnamese. (5,5) Five hours of lecture and one to two hours of discussion per week. Prerequisites: 1A or equivalent or consent of instructor; 100A or consent of instructor is a prerequisite for 100B. Formerly Vietnamese 1A. An introduction to modern spoken and written Vietnamese, including intensive drill on basic phonology and grammar. By the end of the second semester, students should be able to function successfully in ordinary Vietnamese conversation and read simple texts of moderate difficulty. (F,SP) Staff

Upper Division Courses

100A-100B. Intermediate Vietnamese. (5,5) Five hours of lecture and one to two hours of discussion per week. Prerequisites: 1A-1B, or consent of instructor; 100A or consent of instructor is a prerequisite for 100B. Formerly Vietnamese 100A. A second-year course in Vietnamese vocabulary and syntax with intensive drills on short colloquial expressions and auditory recognition of speech patterns. First semester course stresses phraseology, sentence building, rules of composition and development of students’ communicative skills. By the end of the second semester, students will learn to speak and write simple compositions and will have a cursory introduction to Vietnamese literature and sample readings from contemporary Vietnamese writers. (F,SP) Staff

101A. Advanced Vietnamese. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 100B or equivalent. This course is designed for students who have already achieved an intermediate degree of proficiency in speaking, reading, and writing modern Vietnamese. Objective: to move students toward a greater level of fluency in each of these key areas and provide an introduction to the literature and culture of Vietnam by reading Vietnamese language texts. Readings will vary from semester to semester and will include novels, short stories, poetry, and essays from the classical, colonial, post-colonial, and contemporary periods. Topics to be addressed in class are the nature of the Sino-Vietnamese classical tradition; cultural legacies of French colonialism; the regional character of literary and cultural production; the emergence of a distinctive Vietnamese modernity, and the history of Vietnamese gender norms and relations. Regular attendance and participation in classroom activities is mandatory and no English will be spoken in class. (F,SP) Staff

101B. Advanced Vietnamese. (3) Course may be repeated for credit with consent of instructor. Three hours of lecture per week. Prerequisites: 101A or equivalent. A continuation of 101A, with the goal of conversational fluency, advanced reading competence, and facility in writing. This course also provides an introduction to the literature and culture of Vietnam through a close reading of Vietnamese language texts. Readings will vary from semester to semester and will also be given in spoken Vietnamese, including intensive drill on basic phonology and grammar. By the end of the second semester, students should be able to function successfully in ordinary Vietnamese conversation and read simple texts of moderate difficulty. (F,SP) Staff

Spanish and Portuguese

(College of Letters and Science)

Department Office: 5319 Dwinelle Hall, (510) 642-0471 spanish-portuguese.berkeley.edu
Acting Chair: Michael Mascuch

Professors

Milton M. Azeevedo, Ph.D. Cornell University. Hispanic linguistics, applied linguistics
Emile L. Bergmann, Ph.D. Johns Hopkins University. Spanish Golden Age literature, literary theory
Anthony J. Cascardi, Ph.D. Harvard University. Spanish Golden Age literature, literary theory
Dru Dougherty, Ph.D. Harvard University. Modern Spanish literature and theater
Charles S. Faulhaber, Ph.D. Yale University. Medieval Spanish literature
Francisco R. Massari, Ph.D. University of Michigan, Spanish American literature
Candace Slater, Ph.D. Stanford University. Brazilian literature, Hispanic folk traditions
Arthur L. Askins (Emeritus), Ph.D.
Jerry H. Dock (Emeritus), Ph.D.
Louis A. Munro (Emeritus), Ph.D.
John H. B. Poll (Emeritus), Ph.D.
Julio Ramos (Emeritus), Ph.D.

Associate Professors

Natalia Bricuela, Ph.D. New York University. 19th- and 20th-century Latin American literature
Michael Iarocci, Ph.D. University of Pennsylvania. 18th- and 19th-century Spanish literature and culture
Ignacio E. Navarrete, Ph.D. Indiana University. Late Medieval and early modern literature, literary theory
Estelle C. Tarica, Ph.D., M.A. Cornell University. 20th-century Latin American literature and culture

Assistant Professor

Vonne del Valle, Ph.D. University of California, Berkeley. Latin American colonial studies, esp. Mexico; Baroque and Enlightenment

Lecturers

Amelia Barill, Ph.D. University of California, Berkeley
Cecilia Dosman, M.A. San Francisco State University. (Director, Portuguese Language Program)

Department Overview

The sequence of undergraduate and graduate programs of the Department of Spanish and Portuguese is designed to lead from the acquisition of competence in written and spoken Spanish or Portuguese, through an acquaintance with the structure and history of one or both of these lan-
guages and a critical understanding of the develop-
ment and achievements of their literatures in the
Old World and in the New, to training in advanced
study and independent research. The depart-
ment’s policy is to maintain a balanced strength
between language and literature and between Iberian and Latin American facets of a
unified field.

The Major

Option A: Spanish and Spanish American

Lower Division. Courses 1, 2, 3, 4, and 25 (or
their equivalents). Students transferring from other
institutions with advanced standing and intending
to major in Spanish must present evidence (by
examination or otherwise) that their preparation
includes the equivalent of Spanish 25.

Upper Division. A minimum of 10 upper division
courses totaling at least 30 units in the depart-
ment, including Spanish 102A and 135W; two
courses in Spanish literature, one in Medieval or
Golden Age and one in Modern; two courses in
Spanish-American literature; one course in Span-
ish linguistics or theoretical approaches to litera-
ture; and one upper division elective course in
Catalan, Portuguese, or Spanish (but excluding
Catalan 101, Portuguese 101A-101B and 102. In
addition, students are required to complete two
courses (upper or lower division) from outside the
department, specifically related to the major.

Option B: Luso-Brazilian

Lower Division. Portuguese 11 and 12 or Por-
tuguese 101 and 102 (or their equivalents). Stu-
dents transferring from other institutions with ad-
vanced standing and intending to enroll in the
program must present evidence (by examination or otherwise) that their preparation
includes the equivalent of Portuguese 11 and 12 or Portuguese 101 and 102.

Upper Division. A minimum of 10 upper division
courses totaling at least 30 units in the depart-
ment, including Portuguese 103; Portuguese 104 and
107A in Brazilian literature; Portuguese 107A or 107B and one other course in
Portuguese literature; one course in Portuguese
linguistics or theoretical approaches to literature; and four upper division elective courses from
the offerings of the department. Students must
receive the equivalent of Spanish 25 and five other
courses in Spanish, Portuguese, or Catalan
language, literature, linguistics, or culture, from
the offerings of the department. In addition, students are required to complete two courses (upper or
lower division) from outside the department, spe-
ifically related to the major.

Option C: Iberian or Latin-American

Lower Division. Spanish 1, 2, 3, 4, and 25 (or
their equivalents). Students transferring from other
institutions with advanced standing and intending
to enroll in the program must present evidence (by examination or otherwise) that their preparation
includes the equivalent of Spanish 25.

Plan 1: Iberian Upper Division. A minimum of
10 upper division courses totaling at least 30 units
in the department, including Spanish 102A and
135W; Catalan 101 or Portuguese 101; one course
from the literature of Spain, and one course from
the literature of Portugal or Catalonian; five other
courses in Spanish, Portuguese, or Catalan
language, literature, linguistics, or culture, from
the offerings of the department. In addition, students and
are required to complete two courses (upper or
lower division) from outside the department, spe-
cifically related to the major.

Plan 2: Latin American Upper Division. A mini-
um of 10 upper division courses totaling at least
30 units in the department, including Spanish 102A
and 135W; Portuguese 101; one course from the
literature of the Spanish America; one course from
the literature of Brazil; five other courses in Span-
ish/Portuguese language or linguistics, or in Bra-
zilian or Spanish-American literature or culture, from
the offerings of the department. In addition, stu-
dents are required to complete two courses (upper
or lower division) from outside the department,
specifically related to the major.

If the student from previous training has the
equivalent of Portuguese 101, 102, or Catalan
101, any or all of these courses may be excused and
replaced by further electives as appropriate.

Option D: Hispanic Languages and

Bilingual Issues

Lower Division. Spanish 1, 2, 3, 4, and 25 (or
their equivalents). Students transferring from other
institutions with advanced standing and intending
to enroll in the program must present evidence
(by examination or otherwise) that their preparation
includes the equivalent of Spanish 25.

Upper Division. A minimum of nine upper division
courses totaling at least 27 units, of which at least
21 upper division units must be taken in the
department. Cross-listed courses count only
forward toward the major. In addition, students are required to complete one course (upper or lower division)
from outside the department, specifically related to
the major. Department courses must include the
following distribution:

(1) Core languages courses: 102A and 135W (6 units).

(2) Core linguistics courses: Spanish 100 (3 units);
one course in Spanish linguistics that includes dis-
cussion of aspects of Spanish/English contrastive
linguistics, including, but not limited to, problems of
interlanguage equivalences and translation (3 units);
one course in Spanish linguistics such as Spanish 162, 165, or equiv-
alent, dealing with language variation (3 units).

(3) Core literature/culture courses: One course in
Latin-American literature (3 units); one course in
Latin-American literature/culture or Peninsular
literature/culture (3 units); or Spanish 165. Co-
existence and Conflict: Amerindian, English, and
Spanish in the Southwest (3 units).

Courses taken outside the department must be
department’s major adviser before

enrollment. These courses must have the following
distribution (list offered as an example of possi-
bility combinations; a more complete list is
available from the department): (1) one upper di-
vision course dealing with bilingualism issues, such as Psychology 141 (3 units);
(2) one upper division course in U.S. Hispanic lit-

ture/culture, such as Chicano Studies 150 or
172; (3) one course, lower or upper divi-
sion, specifically related to the major.

This course may be taken on a passed/not passed basis.

Hons Program

To be admitted to the Honors Program in Options
A, B, C, or D, students must have completed at least
two semesters of work at Berkeley with an
overall GPA of at least 3.3 and a GPA of at least
3.6 in courses in the major. Students must also
demonstrate the approval of the major adviser in consul-
tation with other members of the department.

Students admitted to the Honors Program must
complete, preferably before, but not later than,
the second semester of the senior year, seven core
courses for either option A, B, C, or D or give evi-
dence, by special examination, of equivalent prepa-
ration. Students passing an examination in lieu of
the required courses will be deemed to
have satisfied the corresponding requirement for
the major, though without obtaining unit credit.

Students in the Honors Program must complete
one course, specifically related to the major, which
are offered each semester. These courses consti-
tute of independent study and the writing of a thesis
over the course of two semesters under the direc-
tion of an appropriate member of the department.

The Minor

General Requirements: (1) courses must be com-
mpleted with a letter-grade basis; (2) a minimum GPA
of 2.0 in the courses of three of the courses to be completed at Berkeley;
(4) no more than one of the courses may also be
used for a major program of another department or
group; (5) courses in English translation and Span-
ish 197 may not be offered in satisfaction of the
elective portions of the minor programs.

The Minor in Spanish Language and Litera-
tures. Prerequisites: Spanish 1, 2, 3, 4, and 25 (or
their equivalents). Requirements: Five upper di-
vision courses in Spanish/Spanish American
language, linguistics, literature, or culture, selected
to offer the offerings of the department.

Minor in Spanish Linguistics. Prerequisites:
Spanish 1, 2, 3, 4, and 25 (or their equivalents).
Requirements: Spanish 100 (Introduction to Span-
ish Linguistics) and four other upper-division Span-
ish linguistics classes, from among Spanish 161,
162, 163, 164, 165AC, 166, and 179.

Minor in Luso-Brazilian Language and Litera-
tures. Prerequisites: Portuguese 11 and 12 or
101 and 102 (or their equivalents). Requirements: Five upper
division courses in Portuguese/Brazilian lan-
guage, linguistics, literature, or culture, selected
to offer the offerings of the department (excluding
the prerequisites of Plan 1 or Plan 2).

Procedures: No formal declaration of enrollment in
the minor program is required. Upon comple-
tion of the program, however, students must file
with the undergraduate assistant of the depart-
ment the Petition for Confirmation of Minor Pro-
gram Completed form signed by the department
adviser for the minor program. Students in-
terested in either program should, therefore, work
close with the department adviser for the minor program to assure proper fulfillment of the
requirements.

Recommended for All Programs: Further study in
Latin, and in Western European, Semitic, and
Latin American history, languages, and literatures.

Latin American Studies. For the group major in
Latin American studies, see the Latin American Studies section in this catalog.

Graduate Program

Students are admitted for post-baccalaureate work
leading to the Ph.D. degree. The Department of
Spanish and Portuguese offers two doctoral pro-
dgms: Romance Languages and Literatures, and
Hispanic languages and literatures.

Romance Languages and Literatures (with
emphasis in Spanish). Prerequisites for admis-
sion: This program requires for admission an A.B.
degree with a major in Spanish approximately
equivalent to the undergraduate major at Berkeley
(Option A), or, for Plan III (see below), in languages
with expertise in Spanish.

Requirements for the Ph.D. degree: No specific
courses are required, but students, in consulta-
tion with a graduate adviser, will lay out a program
designed to prepare them for the qualifying exam-
ination preceding advancement to candidacy. As
early as possible, the student will acquire a read-
ing knowledge of Latin, Italian, and French, by
a written examination in one of these languages and
by either written examination or appropriate course-
work in the others. A reading knowledge of
German is recommended. The precise nature of
the qualifying examination will depend on the stu-
dents’ specific choice of plan from among the
three program options:

(1) Plan I: Requires detailed knowledge of Spanish and
Spanish-American literature and language with
Romance philology, with emphasis on Spanish,
as well as further knowledge of a second Romance
literate as a collateral, and of prescribed masterpieces in the third.

(2) Plan II: Requires detailed knowledge of Spanish and Spanish-American literature and familiarization with Romance philology, with emphasis on Spanish, and command of one broad-integrated field (period, movement, or genre) in both Italian and French literature.

(3) Plan III: Requires in-depth knowledge of the structure and history (internal and external) of Spanish, and either the history or structure of French or Italian.

Hispanic Languages and Literatures. Prerequisites for admission: (1) A B.A. degree with studies in Spanish, Spanish-American, Portuguese, or Luso-Brazilian literatures or Hispanic Linguistics; or an equivalent. (2) Demonstrable background in Spanish on Hispanic and/or Luso-Brazilian studies. (2) Native or near-native proficiency in a primary language (either Spanish or Portuguese).

Requirements for conferral of the degree: In close consultation with the faculty, the student will develop a specialization in one of three tracks: Hispanic and Spanish American literature and culture, Luso-Brazilian literature and culture, or Hispanic Linguistics (Spanish, Portuguese, and Catalan). Each track will be organized around four field concepts (space, time, voice, method). Course preparation will lead to the qualifying examination. For admission to the qualifying examination, the student's record at a minimum must show: (1) successful completion of the three-semester research seminar and second year review approval by the end of the fourth semester; (3) satisfaction of course requirements by the end of the sixth semester and, by the end of the seventh semester, completion of all other requirements stipulated at the second year review meeting; (4) demonstrated working knowledge of two additional non-English languages, one of which should be Portuguese or Luso-Brazilian; (5) preparatory work with in-class writing, homework, and peer commentary. Our guide will be Style: Lessons in Clarity and Grace. Students meet together and also individually with the professor. (F,SP) Staff

2. Elementary Spanish. (5) Five hours of recitation and one and one-half hours of laboratory per week.

Prerequisites: 1 or equivalent. Continuation of 1. Not open to students who have completed three years or more of high school Spanish, or native speakers. (F,SP) Staff

3. Intermediate Spanish. (5) Five hours of recitation and one and one-half hours of laboratory per week.

Prerequisites: 2 or equivalent. Continuation of 2. Course includes review and development of grammatical concepts taught in Spanish 1-2, as well as further practice in composition. (F,SP) Staff

4. Intermediate Spanish. (5) Five hours of recitation and one and one-half hours of laboratory per week.

Prerequisites: 3 or equivalent. Continuation of 3. Development of grammatical concepts taught in Spanish 1-3 and further practice in composition. (F,SP) Staff

8. Spoken Spanish. (3) Three hours of lecture per week. A course designed to increase communication skills (speaking ability and listening comprehension) as well as to improve vocabulary control and awareness of grammatical structure. Some reading/laboratory work required for native or near-native speakers. Enrollment limit: 16 students per section. (F,SP) Staff

12. Spanish for Advanced Beginners. (5) Five hours of lecture per week. Prerequisites: Two to three years of high school Spanish, or AP score of one or two, or IB score of two to four, or one semester of community college Spanish. Designed for advanced beginners; that is, students with previous exposure to Spanish. Builds on previous acquaintance with the language and introduces further basic skills: reading, listening, and writing, and, in the case of the more accomplished, lecture comprehension. Preparatory work with in-class writing exercises, done both in and out of class; short and varied creative writing exercises, done both in and out of class; reading and discussion of critical texts on creative writing, as well as selected short stories used as examples of different narrative techniques.

20C. Writing in Spanish. (3) Three hours of private and conversation per week. Prerequisites: 102A with a grade of A- or better. This course will be structured as a fiction writing workshop, with emphasis on short stories.

21. Spanish for Bilingual Students, First Course. (3) Three hours of lecture and one hour of laboratory per week.

Prerequisites: Consent of instructor, formerly 09. An elementary course for students whose native language is Spanish. (F,SP) Staff

22. Spanish for Bilingual Students, Second Course. (3) Three hours of lecture and one hour of laboratory per week.

Prerequisites: Consent of instructor, formerly 70. An intermediate course for students whose native language is Spanish. (F,SP) Staff

24. Freshman Seminars. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to acquaint themselves with the university in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

25. Reading and Analysis of Literary Texts. (3) Three hours of lecture per week. Prerequisites: 4 or equivalent. Introduction to literary concepts, terminology, and theory with application to poetic, dramatic, and prose texts. Required of majors and minors. (F,SP) Staff

39. Freshman/Sophomore Seminar. (3) Course may be repeated for credit as topic varies. Three hours of seminar per week. Seminars designed to introduce undergraduates to areas of Spanish and Latin American literature and culture.

98. Directed Group Study. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to four hours of group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Group study of a topic not included in the regular department curriculum. Topics may be initiated by the student under the sponsorship and direction of a member of the Spanish and Portuguese department's faculty.

Upper Division Courses

Unless otherwise indicated, Spanish 25 or its equivalent is prerequisite to all upper division courses.

100. Introduction to Spanish Linguistics. (3) Three hours of lecture per week. Prerequisites: Spanish 25; prerequisite for Spanish 102C. Overview of contemporary Spanish linguistics. The course surveys areas such as the history of Spanish; the goals and methodology of the language sciences; the Spanish sound system; the form and function of words; syntactic structures; geographical, social, and contextual varieties (dialectal varieties, registers, bilingualism, etc); and a burning question in contemporary linguistics: Spanish in the United States.

102A. Advanced Grammar and Composition. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. (F,SP) Staff

102B. Advanced Grammar and Composition. (3) Students will not receive credit for 102B after taking 102C. Deficiency in 102C cannot be removed by completing 102B. Three hours of lecture per week. Prerequisites: 25 or equivalent. (F,SP) Staff

102C. Creative Writing in Spanish. (3) Three hours of seminar per week. Prerequisites: 102A with a grade of A- or better. This course will be structured as a fiction writing workshop, with emphasis on short stories. It will have three main components: (1) writing of short stories outside of class; (2) short and varied creative writing exercises, done both in and out of class; (3) reading and discussion of critical texts on creative writing, as well as selected short stories used as examples of different narrative techniques.

104A. Survey of Spanish American Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. Beginnings to 1880. (F)

104B. Survey of Spanish American Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. 1880 to the present. (SP)

107A. Survey of Spanish Literature. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. 1700 to the present. (SP)

109. Spanish Drama of the 16th and 17th Centuries. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent.

110. Teaching across the Arts. (3) Three hours of lecture per week. Prerequisites: 25, 102A. This course explores the different interpretations that Spanish narratives offer of musical practices (jazz, salsa, indigenous music, serial music), musicians, and music itself in the context of artistic and intellectual discourse. How do authors include music and the idea of sonority that it implies through narrative forms? How does the linguistic, literary discourse embody musical forms and contents? This transatlantic course is purposely designed to explore the role of music in Hispanic novels and societies. (F,SP) Staff

111A-111B. Cervantes. (3) Three hours of lecture/seminar per week. Prerequisites: 25 or equivalent. Analysis and discussion of selected works by Cervantes: Don Quixote.

112. Studies in Spanish Culture. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. An overview of the culture of Spain, through emphasis on selected topics.

Spanish

Lower Division Courses

1. Elementary Spanish. (5) Five hours of recitation and one and one-half hours of laboratory per week. Beginners' course. Not open to students who have completed two years or more of high school Spanish, or to native speakers. (F,SP) Staff

R1A. Reading and Composition Through Readings from the Spanish-Speaking World. (4) Three hours of lecture and one hour of discussion per week. The course will offer students an introduction to the literature and culture of Spanish-speaking worlds, will help them develop their skills as readers and critical thinkers and make significant progress in their ability to write coherent, intellectually forceful expository prose. We will focus on analytical writing by developing control of argument and style. Essays will be produced through a process of workshop and revision, with in-class writing, homework, and peer commentary. Our guide will be Style: Lessons in Clarity and Grace. Students meet together and also individually with the professor. (F,SP) Staff

R1B. Reading and Composition Through Readings from the Spanish-Speaking World. (4) Three hours of lecture and one hour of discussion per week. The course will offer students an introduction to the literature and culture of Spanish-speaking worlds, will help them develop their skills as readers and critical thinkers and make significant progress in their ability
113. Topics in Latin American Culture. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 25 or equivalent. The purpose of this course is to explore roots of Latin American cultures, the region's search for identity, and some of the main problems it faces today. We will study great social movements, like the Mexican and Cuban revolutions, and analyze their causes and consequences and, especially, their expression in art (e.g. the muralist movement in Mexico, the "corridos" and the narrative of the Mexican revolution, etc.).

114. The Contemporary Spanish American Novel. (3) Three hours of lecture per week. Prerequisites: 25 or equivalent. The course surveys the parts of speech, major processes of word formation, and sentence structure (simple sentence only). Analysis of major syntactic structures of Spanish. The course will examine the discourse of poverty in (primarily) Spanish American and Cuban cultures, the region's search for identity, and some of the main problems it faces today. Must be taken on a satisfactory/unsatisfactory basis.

115. Spanish Poetry. (3) Three hours of lecture per week. Prerequisites: 25. A study of four to seven representative Spanish lyrics poet from the Renaissance to the 20th century. The course emphasizes language as a medium and aims to develop students' familiarity with poetic techniques and with the continuities in the Spanish poetic tradition. Optional translation project. (F,SP)

117. The Picaresque Novel. (3) Three hours of lecture per week. Prerequisites: 25. This course will examine the history and evolution of the picaresque tradition from the Spanish Middle Ages through the Golden Age and into modernity. This course is designed to give to all students an introduction to the main features of the picaresque genre and the ability to understand it within its historical context.

135. Studies in Hispanic Literature. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 25. (F,SP)

135W. Studies in Hispanic Literature—Writing Intensive. (3) Course may be repeated for credit. Three hours of lecture per week. Prerequisites: 102A. Limited to majors and option D. Special topics in Hispanic literature. Fulfills “writing intensive” course requirement for the major. (F,SP)

148. Family Stories. (1) Two hours of lecture and one hour of discussion for five weeks. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. An introduction to narrative forms in the Hispanic world. Emphasis will be placed on the role of oral transmission and its relationship to written literature.

161. Spanish Phonetics and Phonology. (3) Three hours of lecture/discussion per week. Prerequisites: 25 and proficiency in Spanish. The aim of this course is to offer students the theories and practices of articulatory phonetics and phonology of Spanish. In class, we will develop exercises about phonetic and phonological definitions, recognition, production and transcription, which will help the student to acquire skills to analyze the phonological system of Spanish.

162. The Structure of Spanish. (3) Three hours of lecture per week. Prerequisites: 100 (or equivalent with consent of instructor); proficiency in Spanish. Analysis of major syntactic structures of Spanish. The course covers the rules of speech, major processes of word formation, and sentence structure (simple sentences, coordination, juxtaposition, and subordination). There will be intensive practice in analytical practice. (F,SP)

163. Issues of Multilingualism. (3) Three hours of lecture per week. Prerequisites: 100 and proficiency in Spanish. Issues on the interaction of language, culture, and society in multilingual/multicultural settings. Critical examination of multilingualism in language conflict situations, language policies and language planning, language socialization and ideologies, bilingual communicative practices and code-switching. Topics illustrated by case studies from Spanish-speaking communities, including the United States.

164. Spanish Dialectology. (3) Three hours of lecture/discussion per week. Prerequisites: 100 or equivalent. This course will analyze how the Spanish language varies in the different regions where it is spoken (Spain, Spanish America, the United States) through an analysis of social and regional dialects and their representation in select literary works. It will cover aspects like phonological and grammatical characteristics, the standard and nonstandard varieties, and its cultural and social implications. (F,SP)

165AC. Coexistence and Conflict: Amerindian, English, and Spanish in the Southwest. (3) Three hours of lecture per week. Prerequisites: 25 or consent of instructor. After a brief historical introduction, the overall features of the Amerindian languages, Spanish, and English in the Southwest will be presented. The course will examine the influences of each language but wish to complete their knowledge of Latin American cultures, the region's search for identity, and some of the main problems it faces today. Three hours of lecture per week. Prerequisites: 25. (F,SP)

166. Language and Style. (3) Three hours of lecture per week. Prerequisites: 25. Analysis of the linguistic component of literary and nonliterary texts (such as fiction prose, journalism, scientific writing, or advertising) from a linguistic viewpoint. Analysis of texts in Spanish and English from different linguistic structures and highlights structural similarities and differences between these languages. Course applies to the comparative linguistics requirement of Option D.

167. Language and Society in Spanish-Speaking World. (3) Three hours of lecture/discussion per week. Prerequisites: 100 or equivalent. This course will discuss general principles of sociolinguistics and language variation. It will analyze social issues related to the Spanish language in Spain, Spanish America, and the United States, as well as the role of Spanish as a world language. Specific topics will include an overview of the origins of Spanish, contact with other languages, regional and social variation, language shift, and the impact of the media. This course will provide a forum for reflection on the social implications of the language. The readings will provide data and theory, and discussions will contribute to the development of thinking critically about language. (F,SP) Azevedo

168. The Language of Narrative. (3) Three hours of lecture per week. Prerequisites: 25, 166 or consent of instructor. This course adopts a linguistic perspective to examine the cognition-based process in literary and nonliterary texts, written as well as oral. It focuses on questions of syntax, vocabulary, style, dialogue, genre, ideology, and context. It provides a follow-up to Spanish 166, Language and Society in Spanish-Speaking World. Prerequisites: 100 or equivalent. May be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 25. (F,SP) Azevedo

178. Advanced Course in Hispanic Linguistics. (3) Course may be repeated for credit as topic varies. Three hours of lecture per week. Prerequisites: 100 or consent of instructor. (F,SP)

179. Special Topics in German. (3) Course may be repeated for credit as topic varies. Three hours of lecture/discussion per week. Prerequisites: 100. Issues in bilingualism for students of foreign languages. This course explores what research on bilingualism tells us about the nature of language—the cognitive, affective, and social dimensions of second language acquisition, the relation of language and culture, and language and identity. Fieldwork will include observing, recording, and analyzing speakers of German in classrooms, campus, and community settings, and visits to bilingual schools in the area, and interviews with native speakers of various languages on campus. Course taught in English, open to any foreign language major, 3.6 GPA in the major, 3.3 GPA overall. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Limited to senior honors candidates. Direct study centering on the preparation/completion of an honors thesis (see Honors Program, Option A, above). (F,SP)

198. Supervised Group Study. (1-4) Course may be repeated for credit. One to four hours of fieldwork per week, per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Students interested in the teaching of Spanish in local elementary and secondary schools. May be initiated by students under the sponsorship of a member of the Department of Spanish and Portuguese faculty. (F,SP) Staff

199. Supervised Individual Study and Research. (1-4) Course may be repeated for credit. Individual course for majors. Must be based on the regular syllabus. Topic may be selected by the student. Course may be initiated by students under the sponsorship of a member of the Department of Spanish and Portuguese faculty. (F,SP) Staff

200. Proseminar. (1) One and one-half hours of seminars per week for five weeks. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. This course is designed to give all new graduate students a broad view of the department's faculty, the courses they teach, and their fields of specialization. In addition, it will familiarize the students with some practical aspects of the graduate career, issues that pertain to specific fields of research, and questions currently being debated across the profession. The readings for the course will consist of photocopies of articles or chapters of books provided by the department's faculty. (F)

200A. Spanish Proseminar. (1) One and one-half hours of seminars per week for five weeks. Must be taken on a satisfactory/unsatisfactory basis. For Spanish masters majors. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. This course is designed to give new graduate students a broad view of the department's faculty, the courses they teach, and their fields of specialization. It will also familiarize the students with some practical aspects of the graduate career, issues that pertain to specific fields of research, and questions currently being debated across the profession. The readings for the course will consist of photocopies of articles or chapters of books provided by the department's faculty. (F)
206. Research Seminar I. (4) Three hours of lecture per week. Formerly 2004A. This research seminar introduces students to central questions and debates in literary and cultural studies in Spanish and Portuguese. The second objective consists of developing research strategies and the mastery of different academic genres. It will function to introduce students to the research faculty and to identify potential mentors. Students write book reviews, precepts, position papers, and abstracts for applying to conferences, and conference-length papers. (SP)

200C. Research Seminar II. (4) Three hours of lecture per week. Formerly 2008B. The objective of this course is to train students in developing article- or chapter-length critical writing. This is a writing workshop designed to assist students in writing an original research paper. Students will develop a research project concept conceived in one of their other courses and expand it in scope and argument to create a major paper with a significant critical bibliography. This course will serve as a forum for students to meet and discuss their projects, and as an organizational vehicle for their research. (F)

201. Literary Linguistics. (4) Course may be repeated for credit as topic varies. Two or three hours of lecture per week. Applications of linguistic theory to literary texts and the analysis of fiction prose, discussion of their effects on narrative voice. (SP) Azevedo

202. Linguistic History of the Romance Language. (4) Three hours of lecture per week. Prerequisites: Knowledge of at least two of the major Romance languages (French, Italian, and Spanish). Formerly Romance Philology 202. Linguistic development of the major Romance languages (French, Italian, and Spanish) from the common Latin origin. Comparative perspective, combining historical grammar and etymology. Also listed as Italian Studies C201 and French C202. Staff

209. Seminar in Hispanic Linguistics. (4) Course may be repeated for credit. Three hours of seminar per week. (F,SP)

210. Introduction to Medieval Hispanic Literature. (4) Two or three hours of lecture per week.

211. Major Prose Authors of the Golden Age. (4) Two or three hours of lecture per week.

212. Major Poets of the Golden Age. (4) Two or three hours of lecture per week.

214. Major Dramatists of the Golden Age. (4) Two or three hours of lecture per week.

219. Modern Spanish Poetry (After Romanticism). (4) Two or three hours of lecture per week.

220. Colonial Spanish American Literature. (4) Two or three hours of lecture per week.

224. Modern Spanish Poetry (After Romanticism). (4) Two or three hours of lecture per week.

228. Seminar in Spanish American Literature. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. (F,SP) Staff

285. Seminar in Spanish Literature. (4) Course may be repeated for credit as topic varies. Two or three hours of lecture/seminar per week.

298. Special Study for Graduate Students. (2-8) Course may be repeated for credit. Individual conferences. Prerequisites: Graduate standing. Individual conferences on special programs of study or research in a restricted field not covered by available courses or seminars. (F,SP)

299. Special Advanced Study. (8-12) Restricted to students writing doctoral dissertations. Individual conferences. Sections 1-20 to be graded on a letter-grade basis. Sections 21-40 to be graded on a satisfactory/unsatisfactory basis. Prerequisites: Restricted to students writing doctoral dissertations. (F,SP)

301. Individual Study for Master’s Students. (4) Course does not satisfy unit or residence requirements for master's degree. Must be taken only in the semester in which the examination is attempted. (F,SP)

302. Individual Study for Doctoral Students. (4-12) Course does not satisfy unit or residence requirements for doctoral degree. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Approval of graduate adviser. Individual conferences. Prerequisites: Approval of graduate adviser. Individual conferences. Prerequisite: Graduate standing. Individual conferences, intended to provide an opportunity for students to prepare for the comprehensive examination for the M.A. degree. May be taken only in the semester in which the examination is attempted or in the immediately preceding one. (F,SP) Professional Courses

301. Teaching Spanish in College. (3) Three class hours on foreign language teaching and learning per week. Must be taken on a satisfactory/unsatisfactory basis. Prerequisites: Graduate student instructor status. Lectures on methodology, grading and testing, class preparation, textbook evaluation, course design. Includes language laboratory observations and supervised classroom practice. Required for all new graduate student instructors. (F)

302. Practicum in College Teaching of Spanish and Portuguese. (3-6) Course may be repeated for credit. Three to six hours of classroom teaching with regular supervision per week; evaluation conferences. Must be taken on a satisfactory/unsatisfactory basis. (F,SP)

Portuguese

Lower Division Courses

11. Elementary Portuguese. (5) Five hours of lecture and two hours of laboratory per week. Beginner’s course. Not open to students who have taken Portuguese 101 or equivalent, nor native speakers. (F,SP)

12. Elementary Portuguese. (5) Five hours of lecture and two hours of laboratory per week. Prerequisites: 11, or equivalent. Continuation of Portuguese 11. Not open to students who have taken Portuguese 101 or equivalent, nor to native speakers. Completion of this course qualifies students for Portuguese 8, 25, or 102. (F,SP)

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. The Freshman Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Freshman seminars are offered on a wide variety of topics, primarily one or two hours of seminar per week.

303. Contemporary Brazilian Novels. (3) Three hours of lecture per week. Prerequisites: 28 or equivalent. Survey of the novel and the place of the novel in the formation of the modern Portuguese identity. (F,SP) Staff

304. Introduction to Brazilian Literature. (3) Three hours of lecture per week. Prerequisites: 24 or equivalent. A survey of Brazilian literature from the beginnings through to the 20th century, with attention to the relationships between literature and society.

305. Survey of Portuguese Literature. (3) Three hours of lecture/discussion per week. Prerequisites: 24 or equivalent. A survey of Portuguese literature from the beginnings through to the 20th century. (F,SP)

306. Brazil Culture & Society. (3) Three hours of lecture per week. Prerequisites: 28 or equivalent. Culture and society in Brazil. (F,SP)

307. Portuguese Civilization. (3) Three hours of lecture per week. Prerequisites: 24 or equivalent. An overview of major themes in Portuguese cultural and intellectual history. (F,SP)

310. Cervantes. (4) Course may be repeated for credit with different topic and consent of instructor. Two or three hours of lecture/seminar per week. Prerequisites: Graduate standing or consent of instructor. The reading and interpretation of the works of Cervantes, such as Don Quixote and the Novelas ejemplares, the Persiles, and the Galatea, and the dramatic works. Focus will change according to the needs and interests of members of the course but address such issues as the place of Cervantes’ works in literary history, the backgrounds of the works, their reception, and on the themes in modern criticism.

280. Seminar in Spanish American Literature. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. (F,SP) Staff
Two or three hours of lecture per week. Prerequisites: 20 units or equivalent of Portuguese or another Romance language. (F,SP)

180. Special Study for Undergraduates. (1-3) Course may be repeated for credit. Individual conferences. Prerequisites: Senior honor status and 20 units or equivalent of Portuguese or another Romance language. Directed study centering on the preparation/completion of an honors thesis (see Honors Program, Option B, above). (F,SP)

H195. Portuguese Honors Course. (3) Individual conferences or 20 units or equivalent of Portuguese or another Romance language. Directed study centering on the preparation/completion of an honors thesis (see Honors Program, Option B, above). (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One to three hours of independent study per week. Must be taken on a passed/not passed basis. Prerequisites: Senior honor status and 20 units or equivalent of Portuguese or another Romance language. (F,SP)

Graduate Courses

275. Critical and Stylistic Studies of a Single Author or Period. (4) Course may be repeated for credit as topic varies. Three hours of seminar per week. (F,SP) Martinho

275T. Slave Traffic and Colonial History in Literature. (4) Three hours of lecture per week. In this course, we will study the historic and social consequences as they were portrayed in poetry, fiction, auto-biography, and ethnography by writers on both sides of the Atlantic, namely in former Portuguese colonies. The relevance of this experience and discussion has been extensively dealt with in literature. Written accounts in different genres can lead us through multiple narratives about cultural responses to such events. Also listed as African American Studies C275. (F,SP) Jon D. McAuliffe, Ph.D. University of California, Berkeley. Associate Adjunct Professor

Yuval Peres, Ph.D. Hebrew University, Jerusalem. Adjunct Professors

Lisa Goldberg, Ph.D. Brandeis University. Applied probability, Markov chains, Markov random fields, phylogenetics

Martin Wainwright, Ph.D. Massachusetts Institute of Technology. Machine learning, statistical signal/image processing, information theory, graphical models and applications in random fields

Yun S. Song, Ph.D. Stanford University. Computational biology, statistical computing

Yael Peres, Ph.D. Hebrew University, Jerusalem. Probability theory and Hausdorff dimension

Associate Adjunct Professor

Phil Spector, Ph.D. Texas A & M University. Statistical computing

Assistant Adjunct Professor

Jon D. McAuliffe, Ph.D. University of California, Berkeley. Applied statistics, machine learning, bioinformatics, qualitative inference

Statistics (College of Letters and Science)

Department Office: 367 Evans Hall, (510) 642-2781

Chair: Bin Yu, Ph.D.

Professors

David J. Aldous, Ph.D. Cambridge University. Theoretical and applied probability

Peter L. Bartlett, Ph.D. University of Queensland. Machine learning, statistical theory


Ching-Shui Cheng, Ph.D. Cornell University. Experimental design

Sandrine Dudoit, Ph.D. University of California, Berkeley. Noise-based estimation with cross-validation, multiple hypothesis testing, statistical computing, applications in biological and genomic research

Steven N. Evans, Ph.D. Cambridge University. Probability and stochastic processes


Michael J. Klass, Ph.D. University of California, Los Angeles. Theoretical and applied probability

Rasmus Nielsen, Ph.D. University of California, Berkeley. Evolutionary genomics, epigenetics

Deborah Nolan, Ph.D. Yale University. Asymptotic theory, teaching of statistics, technology in education

James W. Pitman, Ph.D. Sheffield University. Probability, stochastic processes

Alistair Sinclair, Ph.D. University of Edinburgh. Design and analysis of algorithms, computational applications of stochastic processes and nonlinear dynamical systems, Markov chain Monte Carlo algorithms, statistical physics, combinatorial optimization

Philip Stark, Ph.D. Scripps Institution of Oceanography, University of California, San Diego. Applied statistics, inverse problems in physical science, statistics in litigation and legislation

Bernd Sturmfels, Ph.D. University of Washington, Seattle. Computational algebra, combinatorial algebraic geometry

Mark van der Laan, Ph.D. University of Utrecht (The Netherlands). Computational biology, optimal methods for discerning disease survival analysis with applications in medical research, causal inference in longitudinal studies

Kenneth W. Wellek, M.D. Cambridge. Multivariate analysis, demographic data

Bin Yu (Chair), Ph.D. University of California, Berkeley. Statistical inference, machine learning, applied statistics, information theory

* Peter J. Bickel (Emeritus), Ph.D.

* Kjetil Doksum (Emeritus), Ph.D.

* Jacob Feldman (Emeritus), Ph.D.

* P. Warwick Millar (Emeritus), Ph.D.

* John Rice (Emeritus), Ph.D.

* Torestore P. Speed (Emeritus), Ph.D.

* Charles J. Stone (Emeritus), Ph.D.

* Aram J. Thomasian (Emeritus), Ph.D.

Associate Professors

Sourav Chatterjee, Ph.D. Stanford University. Central limit theorems, theory of Stein’s method, probability theory

Hayan Huang, Ph.D. University of Southern California. Bioinformatics, distributional approximation

Eichanan Mossel, Ph.D. Hebrew University, Jerusalem. Applied probability, Markov chains, Markov random fields, phylogenetics

Yu S. Song, Ph.D. Stanford University. Computational biology, mathematical optimization, applications of probability and statistics

Martin Wainwright, Ph.D. Massachusetts Institute of Technology. Machine learning, statistical signal/image processing, information theory, graphical models and applications in random fields

Assistant Professors

Noureddine El Karoui, Ph.D. Stanford University. Theory and applications of random matrices, applied statistics

Carl Krahn, Ph.D. Carnegie Mellon University. Spatial statistics, applications in climate and the environment

Elizabeth Purdom, Ph.D. Stanford University, Molecular biology and genetics—in particular, high-throughput germline experiments

Adjunct Professors

Lisa Goldberg, Ph.D. Brandeis University. Applied probability and statistics, statistical inference, stochastic processes, statistical decision making

Yuval Peres, Ph.D. Hebrew University, Jerusalem. Probability theory and Hausdorff dimension

Associate Adjunct Professor

Phil Spector, Ph.D. Texas A & M University. Statistical computing

Assistant Adjunct Professor

Jon D. McAuliffe, Ph.D. University of California, Berkeley. Applied statistics, machine learning, bioinformatics, qualitative inference

Statistics (Graduate Division)

Senior Lecturer

Roger Purves, Ph.D. University of California, Berkeley. Foundations of probability and statistics

Juliet P. Shaffer (Emerita), Ph.D.

Statistical Computing Facility

†Deborah Nolan (Director), Ph.D. Yale University. Asymptotic theory, teaching of statistics, technology in education

Department Overview

The Department of Statistics grants the B.A., M.A., and Ph.D. degrees in statistics. The undergraduate and graduate programs allow students to partici- pate in a field that is growing in breadth of applicability and importance. Understanding the natural and human worlds in the “information age” increasingly requires a statistical approach, and stochastic models and methods are essential components of research and applications across a vast spectrum of fields. UC Berkeley’s Department of Statistics provides students with world-class resources for study and research, including access to the exten- sive computing facilities managed by the Statistical Computing Facility.

Service Courses. The department offers a variety of introductory service courses differing both in mathematical level and topics emphasized. Statistics 2 requires only high school mathematics; 20 and 21 require one semester of calculus; 20 is for students generally; 21 is intended for business or economics majors although both majors will accept 20. Statistics 131A is an upper division course, emphasizing inference methods used in social and life sciences. Statistics 133 provides an introduction to programs and technologies for organizing, analyzing, and visualizing data. Statistics 134 is a thorough beginning upper division course. Statistics 151 treats infer- ence concepts used in engineering and science. Statistics 200A and 200B are graduate-level versions of 134 and 135, respectively.

The Major

Lower Division Courses. Required: Mathematics 1A-1B and 53-54. Mathematics 1A-1B and 53-54 must be completed with minimum grades of C in each. Students lacking only the material on linear algebra in Mathematics 53-54 can obtain this material by taking Mathematics 49. Contact the undergraduate assistant in 367 Evans Hall for further information about requirements for admission to the major. Recommended: Statistics 20, 21, 25, or 131A and some familiarity with computers.

Upper Division Courses. Statistics 133; Statistics 101 or 134; Statistics 102 or 135, and three courses from Statistics 150, 151A, 151B, 152, 153, 155, and 157, including at least one course with a laboratory. In addition, either: (1) Mathematics 110 and two courses from Mathematics 104, 105, 113, 126, 128A, and 185; or (2) a program of three upper division courses from a field in which statistics is applied. The sequence Statistics 200A-200B may be substituted for Statistics 134 (or 101) and 135 (or 102). The courses selected for the major must have the approval of the undergraduate faculty adviser, who may authorize reasonable exceptions and substitutions, including substituting graduate statistics courses for 150, 151A, 151B, 152, 153, 155, and 157, including at least one course with a laboratory.

Double Major. Students are encouraged to combine the statistics major with a major in mathematics, applied mathematics, computer science, or a field of statistical application such as economics.

Honors Program. Students with an overall GPA of 3.3 GPA or higher and a 3.3 GPA or higher in courses in the major may apply for admission to the Honors Program with the approval of the major adviser. The program consists of course H195, which

C prefix=language course for business majors

C prefix=cross-listed course

H prefix=honors course

R prefix=course satisfies R&C requirement

AC suffix=course satisfies American Cultures requirement

W prefix=online course

*Professor of the Graduate School

†Recipient of Distinguished Teaching Award
includes reading in a special topic and writing a thesis.

**Preparation for Graduate Study.** Undergraduate students interested in graduate study in statistics need a strong foundation in mathematics as well as probability and statistics. To prepare for Ph.D. studies in statistical theory or probability, students should take Mathematics 104, 105, 110, 113, and 185. To prepare for Ph.D. studies in applied statistics, students should take Mathematics 150, 151A, 151B, 152, 153, 155, or 157, including at least one course with a laboratory. In addition, Mathematics 110, 113, 151, and either 152 or 153 are required.

**Preparation for an Actuarial Career.** Students who are considering actuarial careers might consider taking Stat 151A, either 150 or 152, and 153 as their 150-level classes. The Society of Actuaries allows students to attempt Exam 4F and either Exam 3L or 24B, all three courses to be counted towards the applied statistical methods validation by Educational Experience requirement. Suggested VEE-approved courses for the applied statistical methods validation include Mathematics 104, 110B, 109A, 115B, and 131. Demog 110 and C175 would also be appropriate cluster courses for students interested in actuarial careers, although these courses are not currently approved for VEE.

**The Minor**

**Lower Division Courses. Required:** Mathematics 1A-1B and 53-54. Mathematics 1A-1B and 53-54 must be completed with minimum grades of C in each.

**Upper Division Courses.** Statistics 101 or 134; Statistics 102 or 135; and three courses from Statistics 150, 151A, 151B, 152, 153, 155, and 157, including at least one course with a laboratory.

The courses for the minor must have the approval of the undergraduate faculty adviser.

**The Graduate Program**

The department offers the M.A. and Ph.D. degrees. For detailed information concerning the requirements for these degrees, including admissions, visit stat.berkeley.edu. The standard Ph.D. program in statistics provides a broad background in probability theory and in applied and theoretical statistics. Additionally, building on the interdisciplinary strengths of the department, there are three specialized Designated Emphasis (DE) tracks: (1) the DE in computational science and engineering; (2) the DE in computational and genomic biology; and (3) the DE in communication, computation, and statistics. Working towards a Ph.D. with a DE is similar to having a minor in a related discipline. In addition, the department, in conjunction with the School of Public Health, offers degrees in biostatistics through the Graduate Group in Biostatistics. There are two biostatistics graduate programs: M.A. and Ph.D. These programs are approved for students who have either a strong mathematical and statistical background with an interest in biomedical sciences, or degrees in the biological sciences with a major interest in mathematical sciences. For further information, see the Biostatistics section in this catalog. For course listings in Biostatistics, see the Public Health section in this catalog.

The M.A. program includes both students who are admitted directly into the department and students obtaining advanced degrees in other departments at Berkeley. Course work is typically tailored to individual interests, and credit toward the degree can be earned by related coursework in other departments.

**Consulting Service**

The Department of Statistics operates a consulting service in which advanced graduate students, under faculty supervision, are available as consultants for a fee per hour. The service is associated with the course Statistics 272, which may be taken for credit. Consulting is free to members of the campus community. Statistical advice can be sought at any stage of the research process. The service is encouraged to contact consultants early in the research process. Visit the Department of Statistics website to find out which faculty member is currently coordinating this service.

**Statistical Computing Facility**

Statistical Computing Facility (SCF) is a unit of the Department of Statistics. Its mission is to provide research services to undergraduate students, postdocs, and faculty in the Department of Statistics with state-of-the-art computing resources, services, and technical knowledge, while supporting the integration of cutting-edge research: activities, innovative instructional programs, and efficient day-to-day computing activities. SCF also supports students and faculty of the Econometrics Laboratory of the Department of Economics.

**Lower Division Courses**

Only one lower division statistics course may be taken for credit.

1. **Introduction to Statistics.** Students who have taken 2X, 5, 20, 21, 21X, or 25 will receive no credit for 1.

2. **Introduction to Probability and Statistics.** (4) Students who have taken 2, 2X, 5, 21, 21X, or 25 will receive no credit for 2.

3. **Mathematics and Statistics 102A-102B.** Linear Modeling: Theory and Applications. (F,SP)

4. **Statistics 135. Concepts of Statistics.** (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Math 54 and either Statistics 101 or 134.

**Upper Division Courses**

5. **Statistics 110. Introduction to Probability.** (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus. Only one of Statistics 134 or 101 may be taken for credit. This course provides an introduction to probability, emphasizing concepts and applications. Conditional expectation, independence, laws of large numbers. Discrete and continuous random variables. Central limit theorem. Topics include the Poisson process, Markov chains, characteristic functions.

6. **Statistics 113. Introduction to Statistical Methods in Computational and Genomic Biology.** (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: Math 54 and either Statistics 101 or 134.

7. **Statistics 131A. Statistical Inferences for Social and Life Sciences.** (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus or consent of instructor. Ideas for estimation and hypothesis testing basic to applications. Linear estimation and normal regression theory.

8. **Statistics 133. Concepts in Computing with Data.** Three hours of lecture and one hour of laboratory per week. An introduction to computationally intensive applied statistics. Topics will include organization and use of databases, visualization and graphics, statistical learning and data mining, model validation procedures, and the presentation of results.

9. **Statistics 130. Concepts of Probability.** (3) Students will not receive credit for 130 after taking 101. Three hours of lecture per week. Prerequisites: One year of calculus. Elementary set theory, probability, random variables, expectation, distribution, limit theorems, estimation, hypothesis testing.

10. **Statistics 133. Concepts in Computing with Data.** Three hours of lecture and two hours of laboratory per week. Prerequisites: Math 54 and either Statistics 101 or 134.

11. **Statistics 135A-135B.** The regression models and related concepts, sample surveys, estimating, confidence intervals, tests of significance, linear estimation and normal regression theory. (F,SP)

**Consulting Service**

12. **Statistics 298. Directed Group Study.** (2) Three hours of research per week. The course may be repeated for credit as topic varies. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passing/not passed basis. Prerequisites: Priority given to freshmen and sophomores.

**Introduction to Probability and Statistics.** (4) Students who have taken 2X, 5, 21, 21X, or 25 will receive no credit for 2.

20. **Introduction to Probability and Statistics.** (4) Students who have taken 2, 2X, 5, 21, 21X, or 25 will receive no credit for 2. Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus. For students with mathematical background who wish to acquire basic concepts. Relative frequencies, discrete probability, random variables, expectation, distribution, estimation, illustrations from various fields.

21. **Introductory Probability and Statistics for Business.** (4) Students who have taken 2X. 5, 20, 21X, or 25 will receive no credit for 2. A deficiency in N21 may be moved by taking 21. Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus. Descriptive statistics, probability models and related concepts, sample surveys, estimation, confidence intervals, tests of significance, controlled experiments versus observational studies, correlation and regression.

39. **Freshman/Sophomore Seminar.** Course may be repeated for credit as topic varies. Sections 1-2 to be graded on a letter-grade basis. Sections 3-4 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.

79. **Field Study in Statistics.** (1-3) Course may be repeated for credit. One to three hours of fieldwork per week. Must be taken on a passed/not passed basis. Supervised experience relevant to specific aspects of statistics in off-campus settings. Individual and/or group meetings with faculty.

**98. Directed Group Study.** (2) Two hours of group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Must be taken at the same time as either Statistics 2 or 21. This course assists lower division statistics students with structured problem solving, interpretation of data, and report writing.

**Upper Division Courses**

131A. **Statistical Inferences for Social and Life Sciences.** (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: One semester of calculus or consent of instructor. Ideas for estimation and hypothesis testing basic to applications. Linear estimation and normal regression theory.

133. **Concepts in Computing with Data.** (3) Three hours of lecture and one hour of laboratory per week. An introduction to computationally intensive applied statistics. Topics will include organization and use of databases, visualization and graphics, statistical learning and data mining, model validation procedures, and the presentation of results.

134. **Concepts of Probability.** (3) Students will not receive credit for 134 after taking 101. Three hours of lecture per week. Prerequisites: One year of calculus. Elementary set theory, probability, random variables, expectation, distribution, limit theorems, estimation, hypothesis testing.

135. **Concepts of Statistics.** (4) Students will not receive credit for 135 after taking 102. Three hours of lecture and two hours of laboratory per week. Prerequisites: Math 54 and either Statistics 101 or 134.

133 recommended. A comprehensive survey course in statistical theory and methodology. Topics include descriptive statistics, maximum likelihood estimation, goodness-of-fit tests, analysis of variance, and least squares estimation. The laboratory includes computer-based data-analytic applications to science and engineering.

C143. **Introduction to Statistical Methods in Computational and Genomic Biology.** (4) Three hours of lecture and one hour of laboratory per week. Prerequisites: Math 54 and either Statistics 101 or 134.

133 recommended. A comprehensive survey course in statistical theory and methodology. Topics include descriptive statistics, maximum likelihood estimation, goodness-of-fit tests, analysis of variance, and least squares estimation. The laboratory includes computer-based data-analytic applications to science and engineering. (F,SP)

150. **Stochastic Processes.** (3) Three hours of lecture per week. Prerequisites: 101 or 103A or 134. Random walks, discrete time Markov chains, Poisson processes. Further topics such as continuous time Markov chains, queuing theory, point processes, branching processes, renewal theory, stationary processes, Gaussian processes. (SP)

151A-151B. **Linear Modelling: Theory and Applications.** (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 102 or 132. Recommended. A coordinated treatment of linear and
152. Sampling Surveys. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 101, 134, or consent of instructor: 133 or 135 recommended. An introduction to time series analysis in the time domain and spectral domain. Topics will include estimation of trends and seasonal effects, autoregressive moving average models, forecasting, indicators, harmonic analysis, spectra.

153. Introduction to Time Series. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Math 53-54 and consent of instructor. Substantial student participation required. The topics to be covered each semester that the course may be offered will be announced by the middle of the preceding semester; see department bulletins.

H195. Special Study for Honors Candidates. (1-4) Course may be repeated for credit. (F,SP)

197. Field Study in Statistics. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog for the number of hours of fieldwork required. Must be taken on a pass/not passed basis. Supervised experience relevant to specific aspects of statistics in off-campus settings. Individual and/or group meetings with faculty. (F,SP)

198. Directed Study for Undergraduates. (1-3) Course may be repeated for credit. Must be taken on a pass/not passed basis. Prerequisites: Consent of instructor. Special tutorial or seminar on selected topics. (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Must be taken on a pass/not passed basis. Prerequisites: Consent of instructor. Special tutorial or seminar on selected topics. (F,SP)

200A-200B. Introduction to Probability and Statistics at an Advanced Level. (4,4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Two years of calculus and one semester of linear algebra. Probability spaces, random variables, distributions in probability and statistics, central limit theorem, Poisson processes, transformations involving random variables, estimation, confidence intervals, hypothesis testing, linear models, large sample theory, categorical models, decision theory. (F,SP)

204. Probability for Applications. (4) Students will receive no credit for 204 after taking 205A-205B. Three hours of lecture per week. A treatment of ideas and techniques most commonly found in the applications of probability. Gaussian and Poisson processes, limit theorems, Markov chains, Markov chains with transition matrices, Brownian motion, and diffusion. (F) Evans

C205A. Probability Theory. (4) Three hours of lecture per week. Some knowledge of real analysis and metric spaces required. Riemann integral. Knowledge of Lebesgue integral and/or elementary probability is helpful but not essential, given otherwise strong mathematical background. Measure theory concepts needed for probability. Expectation, distribution, laws of large numbers and central limit theorems for independent random variables. Characteristic function methods. Conditional expectations; martingales and martingale convergence. Stationary processes. Also listed as Mathematics C218A. Staff

C205B. Probability Theory. (4) Three hours of lecture per week. Some knowledge of real analysis and metric spaces, including compactness, Riemann integral. Commonly used notations and terminology. Elementary probability is helpful but not essential, given otherwise strong mathematical background. Measure theory concepts needed for probability. Expectation, distribution, laws of large numbers and central limit theorems for independent random variables. Characteristic function methods. Conditional expectations; martingales and theory convergence. Markov chains. Stationary processes. Also listed as Mathematics C218B. Staff

C206A. Stochastic Processes. (3) Course may be repeated for credit with a different instructor. Three hours of lecture per week. The content of this course changes from year to year. Course topics will be selected from the general theory of processes, sample function properties, weak convergence, Brownian motion, diffusion, Levy processes, Markov processes, martingales, Gaussian processes, and further topics. Also listed as Mathematics C223B. (F,SP) Staff

C206B. Stochastic Processes. (3) Course may be repeated for credit with a different instructor. Three hours of lecture per week. The content of this course changes from year to year. Course topics will be selected from the general theory of processes, sample function properties, weak convergence, Brownian motion, diffusion, Levy processes, Markov processes, martingales, Gaussian processes, and further topics. Also listed as Mathematics C223B. (F,SP) Staff

210A-210B. Theoretical Statistics. (4,4) Three hours of lecture and two hours of laboratory per week. Prerequisites: C205 A/B or upper division probability and statistics; a course in linear algebra. A survey of mathematical statistics: in particular both small and large sample theorems of hypothesis testing, point estimation, and confidence intervals with applications to topics such as exponential families, univariate and multivariate linear models and nonparametric inference. (F,SP)

212A. Topics in Theoretical Statistics. (3) Course may be repeated for credit with different instructor. Three hours of lecture and two hours of laboratory per week. Prerequisites: A year of upper division probability and statistics. Typical topics, which change from year to year, include the maximum likelihood estimation, information theoretic and structural risk minimization approaches. Markov decision processes and partially observable Markov decision processes. Reinforcement learning. Also listed as Computer Science C281A. (SP) Bartlett, Jordan, Wainwright

241B. Advanced Topics in Learning and Decision Making. (3) Three hours of lecture per week. Prerequisites: C241A or C281A. Recent topics include: Graphical models and approximate inference algorithms. Markov chain Monte Carlo, mean field and field propagation methods. Model selection and stochastic simulation. Approximation methods, graph theory and structural risk minimization methods. Also listed as Computer Science C281B. (SP) Bartlett, Jordan, Wainwright

243. Introduction to Statistical Computing. (4) Course may be repeated for credit. Three hours of lecture and two hours of laboratory per week. Prerequisites: Graduate standing. The structure and use of computer languages and packages for statistical data analysis. Also listed as Graphic Design 204A. (F) Staff

244. Statistical Computing. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: Knowledge of a higher-level programming language. Algorithms in statistical computing; random number generation, generating other distributions, random sampling and permutations. Matrix computations in linear models. Nonlinear optimization with applications to statistical procedures. Theories of graphical displays in data analysis. Statistical data base management. (F)

245A. Biostatistical Methods: Advanced Categorical Data Analysis. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: C240A. Offered odd-numbered years. (F) Staff

245B. Biostatistical Methods: Survival Analysis and Causality. (4) Three hours of lecture and two hours of laboratory per week. Prerequisites: 200B
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Dudoit, Huang, Nielsen, Song
dents and advanced undergraduate students from the
group and sequencing gene expression experiments.
This is the second course, which focuses on sequence
areas in statistics. The first course in this two-semester
least one computing language (e.g. R, MATLAB) is
lecture and one hour of discussion per week.
Prerequi-
Nielsen, Song
students  from the mathematical sciences. Also
for graduate students and advanced undergraduate
ping. The second course is Statistics C245F/Public
Health C240E. Statistical Genomics. (4)
Dudoit
as Public Health C240C. Offered even-numbered
years. (F) Dodot
C245C. Biostatistical Methods: Computational
Statistics with Applications in Biology and Medi-
cine. (4) Three hours of lecture and two hours of lab-
oratory per week. Prerequisites: 2004A-200B (may be
taken concurrently) or consent of instructor. This
course provides an introduction to computational sta-
tistics, with emphasis on statistical methods and soft-
ware for addressing high-dimensional inference
problems in biology and medicine. Topics include
numerical and graphical data summaries, loss-based
estimation (regression, classification, density estima-
tion), smoothing, EM algorithm, Markov chain Mont-
carlo, clustering, resampling, hidden 
Markov models, in silico experiments. Also listed as
Public Health C240C. Offered even-numbered
years. (F) Dodot
C245E. Statistical Genomics. (4) Three hours of lec-
ture and one hour of discussion per week. Prerequi-
sites: 2004A and 200B or equivalent (can be taken
concurrently). Genomics is one of the fundamental
areas of research in the biological sciences and is
rapidly becoming one of the most important application
areas in statistics. This course is the first of a two-
semester sequence, which provides an introduction

to statistical and computational methods for the anal-
ysis of meloiss, population genetics, and genetic map-
ning. The second course is Statistics C245F/Public
Health C240F. The courses are primarily intended for
graduate students and advanced undergraduate
students from the mathematical sciences. Also listed as
Public Health C240E. (SP) Dodot, Huang,
Nielsen, Song
C245F. Statistical Genomics. (4) Three hours of lec-
ture and one hour of discussion per week. Prerequi-
sites: 2004A and 200B or equivalent (can be taken
concurrently). A course in algorithms and knowledge of at
least one mathematical programming package (e.g. R, MATLAB) is
recommended. Genomics is one of the fundamental
areas of research in the biological sciences and is
rapidly becoming one of the most important application
areas in statistics. This is the first course in this two-
semester sequence which is Public Health C240E/Statistics C245E.
This is the second course, which focuses on sequence
analysis, phylogenetics, and high-throughput microar-
ray and sequencing gene expression experiments.
The courses are primarily intended for graduate
students and advanced undergraduate students from the
mathematical sciences. Also listed as Public Health
C240F. (SP) Dodot, Huang, Nielsen, Song
C247C. Longitudinal Data Analysis. (4) Three hours of
lecture and two hours of laboratory per week. Prerequi-
sites: Public Health 142, 145, 241 or equivalent
courses in basic statistics, linear and logistic regres-
sion. The course covers the statistical issues sur-
rounding the estimation of effects using data on subjects
followed through time. The course emphasizes a
regression model approach and discusses disease
incidence modeling and both continuous outcome data/linear
and categorical outcomes as well as non-
linear models (e.g., logistic and Poisson). The
primary focus is from the analysis side, but mathematical intu-
iton behind the procedures will also be discussed.
The statistical material includes some survival analysis, linear models, logistic and Poisson
regression, and matrix algebra for statistics. The
course will conclude with an introduction to recently
developed causal regression techniques (e.g., mar-
ginal structural models). Time permitting, serially cor-
related data on ecological units will also be discussed. Also listed as Public Health C242C. Offered even-
numbered years. (SP) Hubbard, Jewell
246. Analysis of Time Series. (4) Three hours of
lecture and two hours of laboratory per week. Prerequi-
ts: 102 or equivalent. Frequency-based tech-
niques of time series analysis, spectral theory, linear
filters, estimation of spectra, estimation of transfer functions, design, smoothing, vector-valued
stationary processes, model building.
249A. Censored Longitudinal Data and Causal
Inference. (4) Three hours of lecture and two hours of labora-
tory per week. Prerequisites: 2004A-200B, Public Health
C240E/C240F. This course examines the
optimal robust methods for statistical inference regarding
causal and non-causal parameters based on lon-
gitudinal data in the presence of informative censoring
and informative confounding of treatment. Models pre-
vised include multivariate regression models, mul-
tiplicative intensity models for counting processes,
and causal models such as marginal structural models
and structural nested models. Methods will be illus-
trated with data sets of practical interest and analyzed
in the laboratory section. This course, appropriate for
advanced masters and Ph.D. students, provides
exposure to a number of ongoing research topics.
Also listed as Public Health C242C. Offered even-
numbered years. (SP) van der Laan

249C. Multiple Testing and Loss Function Based
Estimation: Applications in Biological Sciences. (3)
Three hours of lecture per week. Prerequisites:
Public Health 240D or consent of instructor: Statistical
computer-intensive methods have become an inte-
gral part of the analysis of cross-sectional and lon-
gitudinal studies involving the collection of genomic data
such as gene expression, single nucleotide polymor-
phism, and comparative genomic hybridization mea-
urements across the whole genome. These data
structures are extremely high dimensional and the
characteristics (parameters of interest) of the popu-
lation are complex by high dimensional, and outcomes
such as survival are often subject to censoring.
In addition, one often aims to learn and test many uni-
variate characteristics simultaneously (e.g., regres-
sion coefficient for each gene). This course will
present: (1) a unified loss-function-based approach
for learning from the data such characteristics which
relies on general cross-validation methodology to
select among candidate estimators; (2) resampling-
based multiple testing methods controlling type I errors;
and (3) clustering methods embedded into a statistical
framework. Also listed as Public Health C242C. (F)
d van der Laan

251. Stochastic Analysis with Applications to
Mathematical Finance. (3) Three hours of lecture per
week. Prerequisites: 205A or consent of instructor.
The essentials of stochastic analysis, particularly those
most relevant to financial engineering, will be sur-
veyed: Brownian motion, stochastic integrals, Ito’s
formula, representation of martingales, Girsanov’s
theorem, stochastic differential equations, and diffu-
sion processes. Examples will be taken from the
Theory ofskip, contingent claims and related option
valuation/valuation/hedging contingent claims such as options, foreign market
derivatives, and interest rate related contracts. (SP)

260. Topics in Probability and Statistics. (3) Course
may be repeated for credit. Three hours of lecture per
week. Special topics in probability and statistics offered
according to student demand and faculty availability.

261. Quantitative/Statistical Research Methods
in Social Sciences. (3) Two hours of lecture per
week. Prerequisites: Consent of instructor. Selected
topics in quantitative/statistical methods of research
in the social sciences and particularly in sociol-
ogy. Possible topics include analysis of qualitative/
categorical data; loglinear models and latent-struct-
ure analysis; the analysis of cross-classified data
having ordered and unordered categories; measure,
models, and graphical displays in the analysis of cross-
classified data; correspondence analysis, association
analysis, and related methods of data analysis. Also
listed as Sociology C271D.

272. Statistical Consulting. (3) Course may be
repeated for credit. Two hours of session per week and
individual meetings as necessary. Must be taken on
a satisfactory/unsatisfactory basis. Prerequisites:
Some coursework in applied statistics and permis-
sion of instructor. To be taken concurrently with service
as a consultant in the department’s drop-in consulting
service. Participants will work on problems arising in
the service and will discuss general ways of handling
such problems. There will be working sessions with
researchers in substantive fields and occasional lec-
tures on consulting. (F,SP)

278B. Statistics Research Seminar. (1-4) Course
may be repeated for credit. Two or more hours of seminar per week. Must be taken on a satisfactory/ unsatisfactory basis. Special topics, by means of lec-
tures and informational conferences. (F,SP)

296. Resources for Statistical Computing. (1) One
hour of lecture per week and a small amount of hands-
on work. Statistical computing plays a central role in
research and in instruction at all levels of the depart-
ment’s curriculum. This course provides first year
graduate students with an introduction to the Statisti-
cal Computing Facility, including the basis of the UNIX
system and commonly used packages, thus enabling
them to use it effectively in their own courses and
research and as teaching assistants in undergradu-
ate courses.

298. Directed Study for Graduate Students. (1-12)
Course may be repeated for credit. Prerequisites:
Consent of instructor. Special tutorial or seminar on
selected topics. (F,SP)

299. Individual Study Leading to Higher Degrees. (2-
12) Course may be repeated for credit. (F,SP)

601. Individual Study for Master’s Candidates. (1-
8) Course may be repeated for a maximum of 16
units. By appointment. Must be taken on a
satisfactory/unsatisfactory basis. Individual study in consultation with the graduate adviser, intended to provide
an opportunity for qualified students to prepare them-
theselves for the master’s comprehensive examinations.
Units may not be used to meet either unit or residence
requirements for a master’s degree. (F,SP)

602. Individual Study for Doctoral Candidates. (1-
8) Course may be repeated for a maximum of 16
units. Course does not satisfy unit or residence
requirements for doctoral degree. Must be taken on a
satisfactory/unsatisfactory basis. Prerequisites: One
year of full-time graduate study and permission of the
graduate adviser. Individual study in consultation with the
graduate adviser, intended to provide an
opportunity for qualified students to prepare themselves
for certain examinations required of candidates for the
Ph.D. degree. (F,SP) Staff

300. Professional Preparation: Teaching of Prob-
ability and Statistics. (2-4) Course may be repeated
for credit. One or two hours of lecture and two to four
hours of laboratory per week. Must be taken on a satisfactory/ unsatisfactory basis. Prerequisites: Graduate stand-
ing and appointment as a graduate student instruc-
ator. Direct supervision on work and on development,
guidance of laboratory classes, course development,
supervised practice teaching. (F,SP)
Overview

At Berkeley, the Department of Theater, Dance, and Performance Studies understands performance to be a mode of critical engagement, a means of creative expression, and a vehicle for public engagement.

Located within the College of Letters and Science’s Division of Arts and Humanities at one of the world’s great universities, B.A. students in theater and performance studies or dance and performance studies and Ph.D. students in performance studies pursue a wide spectrum of research and production. We see performance as a public forum for contemporary ideas, allowing us to test and debate the central concerns of our time in a space that is at once critical, emotional, and collective. We see performance as a transnational cultural form, exploring the politics and poetics of social life in all parts of the world.

The faculty is nationally and internationally known both for its scholarly research and for its artistic work in acting, design, directing, choreography, and experimental performance. Our curriculum ranges from the classics to the contemporary; it cuts across theatrical, dance, and visual arts forms; it spans all corners of the globe, using the environment of performance to deepen UC Berkeley’s critical education in the humanities. Indeed, at a time when many educators call for novel cross-disciplinary intellectual collaboration and project-based learning in higher education, we take pride in our daily commitment to collaboration and to the kind of intellectually rigorous, team-based projects we develop with our students, staff, and faculty both in the classroom and in our production season.

The undergraduate majors and minors are well prepared for the future, both as artists and engineers. The flexibility and integration of our major programs in theater and performance studies and in dance and performance studies make our majors excellent candidates for a variety of professions in the social, corporate, legal, and arts sectors, as well as for admission to graduate programs in the arts and in professional schools. We are proud of the ways our graduates use their critical and expressive skills toward successful careers as professional artists in dance, theater, and experimental performance, as well as in advertising, human resources, publishing, technology, social work, and in all aspects of nonprofit and business administration.

Through the course of their studies, students pursue intensive work in acting, design, directing, technical production, dance, and choreography. At Berkeley, the Department of Theater, Dance, and Performance Studies students are encouraged to specialize in one of several areas within their major.

Undergraduate degree programs are offered both in theater and performance studies and in dance and performance studies. Students are encouraged to pursue their particular interests in the disciplines of design, theatrical performance, performance studies (the literature, history, cultures, and theory of performance), criticism, design, acting, directing, technical production, and dramatic writing. All majors begin with a core of both practical and critical work; students then select an area of concentration (i.e., performance, dance, design, acting, directing, playwriting, technical production, or choreography) and shape their programs in consultation with the undergraduate academic adviser. Senior majors may undertake critical or performance projects or both as the culmination of their studies.

It is expected that students will maintain a 2.0 GPA in the upper division coursework in the major. All letter-graded courses for the major must be taken for a letter grade. A minimum of 8 units of equivalent coursework transferred from Education Abroad Program or other 4-year colleges as electives upon department approval. See the online TDPS Undergraduate Handbook for more information.

The Majors

The department offers majors both in theater and performance studies and in dance and performance studies. Students are encouraged to pursue their particular interests in the disciplines of design, theatrical performance, performance studies (the literature, history, cultures, and theory of performance), criticism, design, acting, directing, technical production, and dramatic writing. All majors begin with a core of both practical and critical work; students then select an area of concentration (i.e., performance, dance, design, acting, directing, playwriting, technical production, or choreography) and shape their programs in consultation with the undergraduate academic adviser. Senior majors may undertake critical or performance projects or both as the culmination of their studies.

It is expected that students will maintain a 2.0 GPA in the upper division coursework in the major. All letter-graded courses for the major must be taken for a letter grade. A minimum of 8 units of equivalent coursework transferred from Education Abroad Program or other 4-year colleges as electives upon department approval. See the online TDPS Undergraduate Handbook for more information.

Theater and Performance Studies Major

Requirements: Declare the major after passing two of the four prerequisite courses:

- one theater course: 10 or 60;
- one performance studies course: 26 or 52AC or 52AC.

Students should choose, in consultation with the faculty or staff adviser, an area of concentration from the upper division courses in the department. More specific information on the major is available in the department office.

Lower Division.

10, 25AC or 52AC, 26, and 60.

Upper Division. At least 24 units of upper division courses in the theater, dance, and performance studies, including three courses from the list below, each course from a different area:

- (a) Performance Theory: 119;
- (b) Performance and History: 125;
- (c) Performance Literature: 126; or
- (d) Performance and Culture: 121 or 122.

In addition, one course from each of the following technical areas:

- Production or design: 172, 173A, 173B, 174A, 174B, 175A, 175B, or 177;
- Technical theater: 167 or 168 (determined by your work in your 60 course).

Electives: Choose upper division electives to focus your major to your area of interest—must be approved by the undergraduate academic adviser.

Dance and Performance Studies Major

Requirements: Declare the major after passing two of the four prerequisite courses:

- one modern dance course: 40A/B (or technique at any level) or 60;
- one performance studies course: 26 or 52AC or 25AC.

Lower Division. 40A, 40B, 26, 52AC or 52AC, 60.

Technique: After declaring the major, students are required to take a technique course each semester: 40A, 40B, 141A, 141B, 142A, 142B, 143A, or 143B.

Lecturers

Martin Berman, B.A. Acting
Luna Dolas, Ph.D. Acting
Christopher Killion, M.F.A. Technical direction
Katherine Williams, B.F.A. Production management, stage management
Carol Munro (Emeritus), M.A. Acting

Affiliated Graduate Group Faculty

Charles Briggs (The Alan Dunsdie Distinguished Professor in Folklore, Ph.D. University of Chicago (Anthropology/Folklore))
Jocelyn Guibault, Ph.D. University of Michigan (Music)
Sophie Volpp, Ph.D. Harvard University (East Asian Languages and Cultures/Comparative Literature)
Alexe Yurchak, Ph.D. Duke University (Anthropology)

*Professor of the Graduate School
†Recipient of Distinguished Teaching Award
Upper Division. At least 24 units of upper division courses in the theater, dance, and performance studies, including three courses from the a-d list above (each course from a different area):

(a) Choreography: 146A and 144 or 114;
(b) Technical theater: 167 or 168 (determined by your work in your 60 course); and
(c) Production or design: one course from 145, 172, 173A, 173B, 174A, 174B, 175A, 175B, or 177.

Electives: Choose upper division electives to focus your major to your area of interest—must be approved by the undergraduate academic adviser.

Rules for Passed/Not Passed
No letter-graded course offered in satisfaction of undergraduate major requirements may be taken passed/not passed.

Honors Program
Majors in the Department of Theater, Dance, and Performance Studies with an overall GPA of 3.3 in the University and in the major may, with the approval of the department, apply for admission to the Honors Program. Students should apply through the department’s major adviser no later than the 13th week of the spring semester of their junior year. If you wish to have your honors project culminate in a stage production, apply by February 1 of the spring semester of your junior year. Students accepted in the Honors Program will include in their programs: H195A, an intensive, critical study of problems of dramatic literature, performance studies, acting, playwriting, directing, dance, choreography, or design; and H195B, development of work begun in H195A, either as a stage production or a written thesis.

The Minors
The department offers two minor programs: theater and performance studies and dance and performance studies. Students should choose, in consultation with the faculty or undergraduate academic adviser, an area of concentration from the upper division courses in theater, dance, and performance studies (and sometimes from other departments). Sample minor programs of study are available in the department office. Students may declare the minor after enrolling in at least one course in the department. A transferred course must be advisor-approved.

Required:
- Students must maintain a minimum GPA of 2.0 in the upper division units for the minor.
- All courses for the minor must be taken for a letter grade.
- A course with the identical course number may only be counted twice toward the minor and only two courses may be repeated in this way.

Visit the website and see the online TDPS Undergraduate Handbook for more information.

Dance and Performance Studies Minor

Lower Division. One course: 25AC, 26, 40A, 40B, 52AC, or 60.

Upper Division. Five upper division courses are required. (Three courses must be taken in the department; and, of the five courses, one must be a required course, plus four electives.)

Required: One upper-division performance studies course: 119, 121, 122, 125, or 126.

Electives: Choose four or more electives to build a focus in your minor.

Graduate Program

The Ph.D. in Performance Studies provides an interdisciplinary and individually crafted curriculum designed to meet the student’s particular areas of interest, with the specific instruction in the different areas of concentration: dramatic literature, performance studies, dance, choreography, or design. This program focuses on the development of skills necessary to the character actor. Students develop characterizations which lie outside their personal experience by performing characters who are not close to themselves in age or background. Students continue to employ the basic acting and vocal techniques introduced in the first half of the semester. Students in the Ph.D. program in performance studies conduct research in a diverse array of interdisciplinary methodologies on projects concerning the fields of theater and performance studies.

Lower Division Courses

R1A-R1B. Introduction to Dramatic Literature. (4,4) Three hours of lecture/discussion per week. Prerequisites: UC Entry-Level Writing requirement or UC Analytical Writing Placement Exam. R1A or its equivalent is prerequisite to R1B. Formerly Dramatic Art 81A. Reading and composition in connection with the study of dramatic literature. R1A satisfies the first half of the Reading and Composition requirement, and R1B satisfies the second half.

10. Introduction to Acting. (3) Six hours of studio sessions per week plus preparation and rehearsals to be arranged. Prerequisites: Audition required. Formerly Dramatic Art 10. This is a theory and performance course that provides an overview of the actor’s creative process. Basic acting techniques are presented in conjunction with exercises, improvisation, and text work, designed to enhance concentration, imagination, vocal resonance, clarity of speech, self confidence, and communication skills. (F.S.P) Staff.

11. Scene Study and Characterization. (3) Six hours of studio per week. Prerequisites: Audition required. Formerly Dramatic Art 11. In this course the emphasis of the students’ studies shifts from the development of basic skills to the development of skills necessary to the character actor. Students develop characterizations which lie outside their personal experience by performing characters who are not close to themselves in age or background. Students continue to employ the basic acting and vocal techniques introduced in 10. (F.S.P) Staff.

12. Speech and Vocal Communication Skills. (2) Four hours of studio per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 12. The objective of this course is to present the student to the basic sound of spoken English through work on basic vocal relaxation techniques, breath, resonance, articulation, and projection practice. The International Phonetic Alphabet (IPA—narrow transcription) is used for purity and clarity of speech sounds. Also work on pitch, rate, quality, and inflection through a variety of material. (SP) Sussel.

24. Freshman Seminar. (1) Course may be repeated for credit as topic varies. One hour of seminar per week. Section 1 to be graded on a letter-grade basis. Section 2 to be graded on a passed/not passed basis. Formerly Dramatic Art 24. This course is designed to introduce freshmen to the study of American drama. The seminar is an introduction to an advanced topic with a faculty member in a small-seminar setting. Freshman seminars are offered in all campus departments, and topics vary from department to department and semester to semester. (F.S.P)

25AC. The Drama of American Cultures: An Introduction to Our Theater. (4) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 25AC. This course provides an introduction to theater through the study of values and issues fundamental to cultural identity, the comparison of selected cultural groups and their relationship to American society as a whole, and the study of drama as an instrument for understanding and expressing cultural identity. Theater of specific cultural groups to be included will be determined by the availability of live theater productions offered on campus and in the Bay Area. This course satisfies the American Cultures requirement. (F.S.P)

26. Introduction to Performance Studies. (3) Three hours of lecture per week. Formerly Dramatic Art 26. This course introduces the critical terms and practices of the contemporary study of performance. Several major terms and important genres of artistic and social performance will be covered; the course will draw critical and disciplinary methods from anthropology and ethnography, from the theory of dance and theater, from literary and cultural theory. Critical and theoretical concepts will be used to analyze a wide range of live and recorded performances, as well as performance texts. (F.S.P) Staff

39. Freshman/Sophomore Seminar. (1-3) Course may be repeated for credit as topic varies. One to three hours of seminar per week. Section 1 to be graded on a letter-grade basis. Section 2 to be graded on a passed/not passed basis. Prerequisites: Priority given to freshmen and sophomores. Formerly Dramatic Art 39. Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. (F.S.P)

40A-40B. Beginning Modern Dance Technique. (2,2) Course may be repeated for credit. Six hours of studio per week. Prerequisites: Audit and consent of instructor. Formerly Dramatic Art 40A. Introduction to performance and theoretical concepts will be used to analyze a wide range of live and recorded performances, as well as performance texts. (F.S.P) Staff.

52AC. Reflections of Gender, Culture, and Ethnicity in American Performance. (3) Three hours of lecture per week. Formerly Dramatic Art 52AC. Working with the premise that the context, content, and form of any dance event serve as a window on culture, we focus on dance associated with at least three of the following groups: African Americans, Asian Americans, indigenous peoples of the United States, Chicano/Latino, and European Americans. We will look at traditional dance events as well as transcultural currents in American dance. This course satisfies the American Cultures requirement. (F.S.P)

60. Stagecraft. (3-4) Two hours of lecture per week and 60 hours of laboratory per semester. Prerequisites: Enrollment via Tele-BEARs, consent of instructor given after evaluation during first week of class. Formerly Dramatic Art 60. This course is a practical introduction to the theories, approaches, and applications of construction techniques for the scenic environment, and includes attention to such aspects of production as scenery, lights, sound, costumes, and stage management. Special emphasis will be placed on stage machinery and rigging, scenery building,
scenery painting, and stage properties. The course involves a laboratory dimension. Students will work on department productions. (F,SP)

66. Special Topics: Theater Arts. (1-4) Course may be repeated for credit. Number of units will vary depending on course format and requirements. One hour of lecture or three hours of laboratory per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 66. Topics vary from semester to semester. May involve visiting artists. Specific attention is given to the methodologies, cultural studies, and aesthetic preoccupations of contemporary theatrical, cinematic, and electronic media. Prerequisites: Permission of instructor. (F,SP) Staff

98. Directed Group Study. (1-5) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricular section of this catalog. One-half to five hours of group study, rehearsal, and performance of a play or musical. Three hours of lecture per week. Formerly Dramatic Art 125. An examination of the historical conditions of performance, either given in a historical period or comparatively, with specific attention to the relationship between methods of historical studies and performance; may involve visiting artists. Topics vary from semester to semester. (F,SP) Staff

119. Performance Theory. (4) Staff

110A-110B. Intermediate Acting. (3;3) Prerequisites: 110A-110B or 111 or consent of instructor. Formerly Dramatic Art 110A-110B. A chronological study of Strindberg’s major works; emphasis on his dramas and their significance. Readings and discussion in English. Also listed as Scandinavian C108. (F,SP) Sandberg

110B. Intermediate Acting. (3;3) Prerequisites: 110A. Course may be repeated for credit. Six hours of studio per week. Prerequisites: Audition, one year of undergraduate work in acting, or consent of instructor. (F,SP) Staff

111. Advanced Acting. (3) Course may be repeated for credit. Six hours of sessions per week plus preparation and rehearsed time. Prerequisites: Audition, two years of undergraduate work in acting, or consent of instructor. (F,SP) Staff

142. Performance Workshop. (3) Course may be repeated for credit. Six hours of sessions per week plus preparation and rehearsal time. Prerequisites: Audition, two years of undergraduate work in acting, or consent of instructor. Formerly Dramatic Art 114. Workshop involving advanced actors, dancers, and spoken-word performers in collaborative development of new performance. Topics include cross-disciplinary arts, solo performance, language, and movement. (F,SP) Staff

115. Advanced Acting: Company Class. (3) Six hours of sessions per week plus preparation and rehearsals. Prerequisites: 110A-110B or 111 or consent of instructor. Formerly Dramatic Art 115. Intensive group work and performance of a play of selected dramatic pieces. (F,SP) Staff

119. Performance Theory. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly Dramatic Art 119. An examination of the theoretical topic or perspective on performance, with specific attention to the relationships between theoretical endeavors and dramatic, nondramatic, and nontheatrical modes of performance; may involve visiting artists. Topics vary from semester to semester. (F,SP) Staff

121. Performance and Culture. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly Dramatic Art 121. An examination of performance as an aspect of cultural production, ranging from everyday-life enactment to more formal or aesthetic activities associated with "artistic" production; may involve visiting artists. Specific attention to the methodologies, cultural studies, and aesthetic concerns of contemporary theatrical, cinematic, and electronic media. Prerequisites: Permission of instructor. (F,SP) Staff

122. African Theater and Performance. (4) Three hours of lecture per week. African performance includes a wide range of vibrant forms: from scripted drama, theatre, dance, and music to oral traditions, storytelling, and ritual. Using sources, materials that are neither "traditional" nor "modern," "African" nor "European," but a complex amalgamation of influences, African performances defy these limiting binary categories. In the process of performing arts, one sees the resilience and tenacity of African cultural forms as repositories of memory, sites of intercultural negotiation, and potent forums for political resistance. (F,SP) Cole

125. Performance and History. (4) Course may be repeated for credit as topic varies. Three hours of lecture per week. Formerly Dramatic Art 125. An examination of the historical conditions of performance, either given in a historical period or comparatively, with specific attention to the relationship between methods of historical studies and performance; may involve visiting artists. Topics vary from semester to semester. (F,SP) Staff

131. Contemporary African American Drama. (4) Four hours of lecture per week. Formerly Dramatic Art C131. Survey of contemporary plays by African American writers and the portrayal of the black experience in American theatre. Emphasis on predominant themes, structural tendencies, sociocultural context. Also listed as African American Studies C151B. (SP) Staff

139. Playwriting. (3) Three hours of lecture/discussion per week. Prerequisites: Consent of instructor. Formerly 139A-139B Practice in the fundamentals of dramatic composition. Group readings and discussion of written work. (F)

141A-141B. Intermediate Modern Dance Technique I. (2) Course may be repeated for credit. Six hours of studio per week. Prerequisites: 40A-40B, audition, or consent of instructor. Formerly Dramatic Art 141A. Development of physical control through off-center movement and its utilization in spatial exploration. (F,SP)

142A-142B. Modern Dance Technique Advanced I. (2,2) Course may be repeated for credit. Six hours of studio per week. Prerequisites: 141A-141B, audition, or consent of instructor. Formerly Dramatic Art 142A. Refinement of movement techniques and qualitative analysis of movement with regard to rhythm, dynamics, and style. (F,SP)

143A-143B. Modern Dance Technique Advanced II. (2,2) Course may be repeated for credit. Seven and one-half hours of studio per week. Prerequisites: 142A-142B or consent of instructor. Formerly Dramatic Art 143A. Exploration of existing styles and forms of movement and their musical relationship using both individual and group awareness. (F,SP)

144. Sources of Movement. (3) Four and one-half hours of lecture/studio per week. Prerequisites: 40A-40B, or consent of instructor. Formerly Dramatic Art 144. Beginning application of dance technique as a means of communication in the theatre. Use of basic technical fundamentals as a means of expanding ranging within the classroom; the use of movement, space, and style in a form of dance; and the use of style and quality analysis. (SP)

145. Music Resources for Performance. (3) Three hours of lecture/studio per week. Prerequisites: 144 or consent of instructor. Formerly Dramatic Art 145. This course is an introduction to the sonic poetry of gesture. Studying historical Eurocentric precedents and current trends in theatrical/dance music, we will examine the work of composers for early royal theater like Rameau and move to the music of composers like Tchaikovsky; look at pre-electronic composers like Varese, Berio, and Stockhausen; shift into the avant garde with Cage; and study contemporary composers like Anderson. Based on lectures and readings. An important aspect of this course is the practical experience and analysis of sonic experimentation in performance. (F)

146A-146B. Choreography. (1-3;1-3) Course may be repeated for credit. Four and one-half hours of studio per week. Prerequisites: Consent of instructor and 114 or 144. Formerly Dramatic Art 146A. Analysis of theories of form and structure and their practical application in relation to content. (F) Staff

148. Introduction to Movement Improvement. (1) Three hours of studio per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Dramatic Art 148. Study and analysis of stage movement through non-verbal approaches. (F)

149A-149B. Repertory and Production. (5-3;5-3) Course may be repeated for credit. Variable studio (one-half unit per dance). Credit and grade to be awarded on completion of sequence. Prerequisites: Audition required. This is a single course extending over two semesters. As of fall 2011, students of dance are organized as a company for the development of a dance repertory for public performance, creation of new dance works, and the study of those already created. The first semester covers the development of repertory. The second semester focuses on performance. Readings and assignments focus on the business of performance and current artistic trends. Some performances/class meetings will be held away from the Berkeley campus. (F,SP)

151B. Theater History. (3) Three hours of lecture per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 151B. A chronological survey of Western theater from 1800 to the present, this course begins with the dismantling of Neoclassical thought in the European theater and the rise of avant-garde and popular forms. Rapidly changing social conditions, cultural tastes, and technological advances in the 19th and 20th centuries are studied in tandem with the development of theatrical productions and movements, playmaking, and acting styles. (F,SP)

153A. History of Western Dance. (3) Three hours of lecture per week. Formerly Dramatic Art 1534. The history of theatrical dance from its origins in ritual and popular culture through to modernity. Topics include dance in Greek comedy and tragedy; pantheonite in the Roman Empire; the medieval Dance of Death and Dancemania; politics and dance in Renaiss ance and Baroque courts; the development of ballet d’action; and the 19th-century ballet masterpieces, including La Sylphide, Giselle, Swan Lake, and Sleeping Beauty. (F) Johnson

153B. Changing Forms in 20th-Century Dance. (3) Three hours of lecture per week. Formerly Dramatic Art 1534. The history of theatrical dance from its origins in ritual and popular culture through to modernity. Topics include dance in Greek comedy and tragedy; pantheonite in the Roman Empire; the medieval Dance of Death and Dancemania; politics and dance in Renaissance and Baroque courts; the development of ballet d’action; and the 19th-century ballet masterpieces, including La Sylphide, Giselle, Swan Lake, and Sleeping Beauty. (F) Johnson

162. Fundamentals of Stage Directing. (3) Four hours of lecture/discussion per week plus preparation and rehearsals. Prerequisites: 10A-10B or 110; junior standing and consent of instructor. Formerly Dramatic Art 162. Beginning study of principles of stage composition, blocking, and analysis of dramatic texts for the director. (F)

163. Stage Directing. (3) Four hours of lecture/performance per week. Prerequisites: 10A-10B or consent of instructor. Formerly Dramatic Art 163. A chronological study of a large selection of works by 20th-century ballet, modern, and postmodern choreographers. We emphasize how dance reflects and affects political climate, social values, religious belief, and cultural context through examining a variety of dance themes, movement vocabularies, and styles. (SP) Johnson

166A. Workshop in Playwriting. (2) Staff

166B. Workshop in Playwriting. (2) Staff

166C. Workshop in Playwriting. (2) Staff

†Recipient of Distinguished Teaching Award

W prefix=online course

B prefix=language course for business majors
C prefix=core-cross-listed course
H prefix=honors course

AC suffix=course satisfies R&C requirement

R prefix=course satisfies American Cultures requirement

Research and Evaluation
166. Special Topics: Theater Arts. (1-4) Course may be repeated for credit. Number of units will vary depending on specific course format and requirements. One hour of lecture or three hours of laboratory per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 166. Topics vary from semester to semester and have included The Power of Music and Poetic Drama, Abraham Lincoln: A Study of Leadership, 1940 to the Present; Theatres, Tricksters, and Cultural Exchange; Art as Social Action; and The Invisible World (Process Seminar). (F,SP) Staff

167. Technical Theater: Performance Practice. (1-3) Course may be repeated in another field at the beginning level. Three hours of laboratory per unit per week. Hours to be arranged. Prerequisites: 60 or consent of instructor. Participation in technical theater practice associated with department theater and dance productions. Lab crew of technical run crew for live performance in one of the following: lighting, sound, video, properties, costumes, make-up, scenery, deck, and rail. (F,SP) Mattson

168. Technical Theater: Shop Practice. (1-3) Course may be repeated in another field at the beginning level. Three hours of laboratory per unit per week. Hours to be arranged. Prerequisites: 60, or consent of instructor. Participation in technical theater practice associated with department theater and dance productions. Lab crew of technical run crew for live performance in one of the following: lighting, sound, video, properties, costumes, make-up, scenery, deck, and rail, or advanced application of work shop activities (fabrication, treatment, and installation) in one or more of the following: costumes, hair, make-up, scenery, properties, lighting, video, and sound for live performance. Intended for a student who has completed introductory level application of theater practice and is training in advanced techniques and applications and/or assuming additional responsibilities in relation to production. (F,SP) Mattson

170. Theatre Laboratory. (1-3) Course may be repeated for credit. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Dramatic Art 170. Non-performing participation in the University Theatre to include: stage management; crew assistance in lighting, sound, video, properties, costumes, make-up, scenery, deck, rail, or advanced application of work shop activities (fabrication, treatment, and installation) in one or more of the following: costumes, hair, make-up, scenery, properties, lighting, video, and sound for live performance. Intended for a student who has completed introductory level application of theater practice and is training in advanced techniques and applications and/or assuming additional responsibilities in relation to production. (F,SP) Mattson

171. Theatre Performance. (1-3) Course may be repeated for credit. Three hours of studio per week per unit. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Dramatic Art 171. Practice in acting and/or dance in dramatic art productions. (F,SP)

172. Advanced Production Study. (4-6) Course may be repeated for credit. Three hours of lecture and three to nine hours of laboratory per week. Prerequisites: Consent of instructor. Formerly Dramatic Art 172. Study of production techniques and procedures related to production management, stage management, and theater administration. (F,SP)

173A-173B. Scenography: Scenic Design for the Theatre. (3,3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. 173A is the prerequisite to 173B. (F,SP)

174A-174B. Scenography: Costume Design for the Theatre. (3,3) Three hours of lecture and three hours of laboratory per week. Prerequisites: Consent of instructor. (F,SP) 175A. Scenography: Lighting Design for the Theatre. (4,4) Three hours of lecture per week and laboratory to be arranged. Prerequisites: Consent of instructor; restricted enrollment of 18. Formerly Dramatic Art 175A. An introduction to theatrical lighting, including practical application through dramatic art productions. (F,SP)

176. Applied Theatrical Design. (1-4) Course may be repeated for credit. Three hours of studio per week per unit. Prerequisites: Consent of instructor; restricted enrollment of 18. Formerly Dramatic Art 176. An introduction to theatrical lighting, including practical application through dramatic art productions. (F,SP)

177. Sound Design and Media Theater. (4) Three hours of lecture and three hours of laboratory per week. In this course, undergraduate students will learn to construct sound cues and soundtracks for theater performances. Hours to be arranged. Prerequisites: 60 or consent of instructor. Participation in technical theater practice associated with department theater and dance productions. Lab crew of technical run crew for live performance in one of the following: lighting, sound, video, properties, costumes, make-up, scenery, deck, and rail. (F,SP) Mattson

179. Supervised Theatrical Design. (1-4) Course may be repeated for credit. Three hours of studio per week per unit. Prerequisites: 173A or 173B, 174A or 174B, 175A or 175B, or consent of instructor. Formerly Dramatic Art 179. Students are trained in the working methods of set or costume design; supervised preparation and implementation of designs in the department’s production season, from initial discussions through opening night. (F,SP) Staff

180. Theatrical Realization of Dance. (1-3) Course may be repeated for credit. Three hours of studio per week per unit. Prerequisites: Audition or consent of instructor. Formerly Dramatic Art 180. This course relates choreography to theatrical presentation. Laboratory hours are spent in attendance at rehearsal, coaching sessions, and the performance of the dance concert. The course is taught by faculty choreographing the major dance production in the departmental season. (F,SP) Staff

181. Theatrical Realization of Dramatic Texts. (1-4) Course may be repeated for credit. Three hours of studio per week per unit. Prerequisites: Audition or consent of instructor. Formerly Dramatic Art 181. This course relates dramatic texts or choreography to theatrical presentation. Laboratory hours are spent in attendance at rehearsal, coaching sessions, and the performance of the play or concert. The course will be taught by faculty involved in the major productions. (F,SP) Staff

C183B. Research-to-Performance Laboratory. (3) Three hours of lecture per week. Formerly Dramatic Art C183B. Development of scholarly material for theatrical presentation and enhancement of dramatic art performances. Improvisations and readings of works conceived by the class and/or writers in other African American studies classes. All source material will be based on the research of scholars in the field of African American studies. Also listed as African American Studies C143B.

C183C. Black Theatre Workshop. (3) Course may be repeated for credit. Three hours of lecture per week. Formerly Dramatic Art C183C. Study and production of a play by an African American writer. The play will be studied within its social and historical context. Students will be introduced to the various aspects of theatrical production. Also listed as African American Studies C143C.

H195A. Honors Course. (4) Hours to be arranged. Prerequisites: Honors status in the Department of Theater, Dance, and Performance Studies. Theater production projects also require 60 and 162; dance production projects also require 60 and 146B. Formerly Dramatic Art H195A. Independent study and conferences with faculty sponsor leading to preparation and presentation of a thesis on a single aspect of theater, dance, or performance studies. May include a performance component. (F,SP)

H195B. Honors Course. (4) Hours to be arranged. Prerequisites: Honors status in the Department of Dramatic Art; successful completion of H195A and consent of production chair if performance is involved. Formerly Dramatic Art H195B. Development of subject studied in H195A, either as a bachelor’s thesis or a laboratory project in acting, directing, playwriting, performance, production, or play production. (F,SP)

196. University Theatre Workshop. (4) Course may be repeated for credit. Twelve hours of studio per week. Prerequisites: Department approval; theater projects also require 60 and 162; dance projects also require 60 and 146B. Formerly Dramatic Art 196. Individual directorial projects for advanced undergraduates. Research, tryout, callbacks, and rehearsals which result in performing for the public will average 20 hours per week. (F,SP) Staff

197. Field Studies in Technical Theatre. (1-4) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Hours to be arranged. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Dramatic Art 197. Supervised experience, in connection with the atrical production in field of: scenic construction; costume construction and conservation; theatrical lighting; stage management; publicity; theatre management; production management.

198. Directed Group Study for Undergraduates. (1-5) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. One-half to five hours of directed group study per week. Must be taken on a passed/not passed basis. Prerequisites: Consent of instructor. Formerly Dramatic Art 198. Supervised group study of special topics, subject to approval by the chair. (F,SP)

199. Supervised Independent Study and Research. (1-3) Course may be repeated for credit. Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog. Individual study. Must be taken on a passed/not passed basis. Prerequisites: 8 or more units in the Department of Dramatic Art, with a minimum average grade of 2.0 or better for 198 undergraduate students. Formerly Dramatic Art 199. Reading and conference with an instructor in an area not corresponding with any regular course. (F,SP) Staff

Graduate Courses

200. Graduate Colloquium on Interdisciplinary Research in Performance. (1,2) Course may be repeated for credit. Graduate students in dramatic art are required to take this course at least three times, the first time for 2 units and thereafter for 1 unit. Two hours of colloquium per week. Formerly Dramatic Art 200. This core course is designed to introduce graduate students to: (1) the research resources of the University; (2) the research interests and methodologies of the faculty affiliated with the Ph.D. program; (3) theater as a profession; and (4) trends and developments in theater studies. Students will work collaboratively on research projects. (F,SP) Staff

201. Performance Theory. (4) Three hours of seminar per week. Formerly Dramatic Art 201. This core seminar for graduate students focuses on key issues in the history of theatrical performance, with an emphasis on contemporary theoretical inquiry. Issues of representation and identity, presence, community, social efficacy, reception and its effects, and the roles of performers and production elements will be addressed. (F,SP) Staff

202. Methodologies and Approaches to Theater in Context. (4) Three hours of seminar per week. For-
Undergraduate and Interdisciplinary Studies
(College of Letters and Science)

Mission

Undergraduate and Interdisciplinary Studies (UGIS) in the Undergraduate Division of the College of Letters and Science serves as a center for innovations in undergraduate education that extend beyond traditional departmental boundaries. Our major and minor programs attract undergraduates who wish to explore the most intellectually engaging and promising interdisciplinary fields under the direction of scholars who are pioneers in charting these new areas and methods of inquiry. UGIS has been, and continues to be, an incubator for new ideas, including experimental programs and courses as well as curricula designed to promote the ideals of liberal arts education. We are especially dedicated to creating programs such as the Freshman and Sophomore Seminar and the Undergraduate Research Apprentice Program that nurture productive intellectual relationships between faculty members and students.

Field Major

Interdisciplinary Studies. The ISP major affords undergraduates a thoroughly interdisciplinary framework for their studies. The program allows students to establish individualized areas of concentration using courses in the humanities, social sciences, and/or professional schools and colleges.

Group Majors

American Studies. This group major offers students the opportunity to study American society using a broad spectrum of courses from a variety of disciplines in the College of Letters and Science and professional schools and colleges. American studies courses will attempt to account for the cultures of America that have been continually reshaped by movements of people, commerce, and ideas crossing borders. The major draws on faculty resources and research in literature, history, economics, architecture, material culture, media studies, ethnic studies, and urban and regional studies.

Cognitive Science. This group major is the cross-disciplinary study of the structure and processes of human cognition and their computational simulation or modeling. This interdisciplinary program has been designed to give students an understanding of questions dealing with human cognition, such as concept formation, visual perception, the acquisition and processing of natural language, and human reasoning and problem solving. The program draws on relevant courses found within the fields of biology, computer science, education, linguistics, neuroscience, and psychology as well as specially designed lower and upper division courses in cognitive science.

Environmental Sciences. The environmental sciences group major has been jointly administered by the College of Letters and Science and the College of Natural Resources. Effective July 1, 2011, the environmental sciences major will be administered solely by the College of Natural Resources. Current students will be given the option to change or continue the degree in Letters and Science. After July 1, 2011, new students should apply to the program through the College of Natural Resources. The curriculum of the major emphasizes a broad and comprehensive education in the fundamentals of biology, chemistry, physics, and mathematics, and in social science directly related to environmental problems. The major is concerned with interactions between human activities and biological and physical environments on all scales, from local to global. Students acquire the necessary skills for rigorous representation and prediction of environmental problems and for making sound recommendations for their avoidance or mitigation.

International and Area Studies. The International and Area Studies office—101 Stephens Hall, (510) 642-4466—administers course offerings in Asian studies, development studies, Latin American studies, Middle Eastern studies, peace and conflict studies (PACS), and political economy. For information about those courses, please contact the individual program sections in this catalog.

Media Studies. The major applies a range of disciplines in the social sciences and humanities to the understanding of contemporary mass media and their structure, history, content, consequences, and policy implications.

Religious Studies. The major provides opportunities for securing a broad background in the liberal arts while, at the same time, allowing for a focus on a thematic concern or particular religious tradition. The major views religion from a global perspective and combines areas in the humanities and social sciences. A religious studies minor is also available.

Minor Programs

Applied Language Studies. Sometimes called applied linguistics, the field of applied language studies is devoted to the study of particular domains of language learning and use, such as foreign language learning and teaching, bi- and multi-lingualism, translation and interpretation, communication in professional contexts, or inter-cultural communication.

Creative Writing. Students earn a minor in creative writing by completing three upper-division creative writing courses and two upper-division literature courses. Students may choose among a wide variety of courses from numerous departments. The creative writing minor is housed in the Office of Undergraduate and Interdisciplinary Studies, 231 Evans Hall. A student handbook outlining minor requirements in detail is available at the UGIS office. For more information, call the UGIS office at (510) 642-0108 or visit ls.berkeley.edu/ugis.

Disability Studies. The disability studies minor explores how best to meet the challenges and alleviate the problems of those with impairments or disabilities, with emphasis on the role of those affected in defining problems and evaluating solutions. The minor requirements consist of two core courses and three approved upper division electives. From a wide variety of courses from numerous departments, the disability studies minor is housed in the Office of Undergraduate and Interdisciplinary Studies, 231 Evans Hall. A student handbook outlining minor requirements in detail is available at the minor office. For more information, call the UGIS office at (510) 642-0108 or visit ls.berkeley.edu/ugis/dis.

Interdisciplinary Human Rights. This minor offers a teaching program specifically focused on human rights but open to myriad disciplinary approaches and welcomes students from many corners of campus. It allows students to shape their education around coursework that investigates the legal, political, historical, economic, psychological, and representational dynamics of human rights. Helping undergraduates explore issues via multiple forms of thought and media of expression—through literature as well as politics, journalism as well as law, film as well as anthropology—the IHR...
minor emphasizes the many different intellectual spaces in which human rights questions are currently being posed. For more information, call the UC Office at (510) 642-0108 or visit ls.berkeley.edu/hr.

Other Programs

In addition to the majors listed above, the Office of Undergraduate Studies has developed innovative introductory courses such as Topics in Western Civilization, The Development of World Civilization, and upper division colloquia and research courses.

The College Writing Programs—112 Wheeler Hall, (510) 642-0108 is designed to help undergraduates establish fluency and control over their reading and writing skills.

Freshman and Sophomore Seminars arose from the conviction that early intellectual contact with faculty members would greatly enhance the undergraduate experience at Berkeley. Professors from nearly every campus department join together each semester to offer an impressive array of seminars. The courses numbered 24 (and in some cases 90) bear 1 credit unit; they are limited to 15 students, and freshmen are given priority for enrollment. The courses numbered 84 bear 1 or 2 units of credit; they are limited to 15 sophomores. The courses numbered 39A-392 are limited to 25 freshmen and sophomores. Seminars, which emphasize interaction and discussion, provide a counterpoint to the learning experience in Berkeley’s larger educational setting. For more information, call the Office of Undergraduate Research at 231 Evans Hall, (510) 642-8378.

Letters and Science Discovery Courses. Students in the College of Letters and Science are asked to fulfill seven breadth requirements. The &S Discovery Courses are exemplary breadth courses, designed to engage and broaden the minds of non-experts. Taught by some of the most distinguished faculty members on campus, the &S Discovery Courses are guaranteed to deliver a high-quality educational experience. For more information, including the current list of courses and the breadth requirements they fulfill, visit l&sc.berkeley.edu.

Scholarship Connection is Berkeley’s clearinghouse for scholarships that are funded by sources outside the University. Enrolled Berkeley students may search its database for awards at scholarships.berkeley.edu, which also contains other useful information and features for undergraduates. For additional information regarding the Freshman and Sophomore Seminars, contact the program office at 231 Evans Hall, (510) 642-8378.

Descriptions of all the seminars scheduled for the upcoming semester can be found in time for Tele-BEARS registration on the semester’s website at sfs.berkeley.edu, which also contains other useful information and features for undergraduates. For additional information regarding the Freshman and Sophomore Seminars, contact the program office at 231 Evans Hall, (510) 642-8378.

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gate the interaction of disability with social factors such as gender, sexual orientation, race, ethnicity, and class. The course is for students with and without disabilities and teaches through the analysis of special interest activities of people preparing for careers in the health professions, education, law, architecture, social work, or gerontology. (F,SP) Staff

112. Women and Disability. (3) Three hours of lecture per week. This course will explore the intersection of disability theory and women’s studies, analyzing the social and personal impact of disability and chronic illness on relationships, identity, employment, health, body image, sexuality, reproduction, motherhood, and aging. Through real stories of lives which reached the media in the last decade and before, students will move toward a dynamic understanding of the impact of a range of physical, emotional, and psychological disabilities in the context of social forces and public policy. We will explore historic perspectives as well as current trends in medicine, independent living, care-giving, insurance, public benefit, laws, and community activism as they affect and are affected by disabled women and girls and their families. We will discuss controversial ethical issues such as prenatal screening, wrongful birth law suits, and physician-assisted suicide. Course readings will draw on the rich literary tradition of disabled women’s autobiographies, biography, and autobiography, and popular literature of disability, feminist and women’s activism, women’s art, film, and the cybernetre. (F,SP) Saxton

113. Disability Studies in Practice. (3) Six hours of internship and one hour of seminar per week. Prerequisites: Consent of instructor. A graded service-learning internship course in disability studies. Students will draw lessons from working in collaboration with major disability rights and independent living organizations. Each student will do an internship at one of these organizations for six hours a week. In addition, there will be a regularly scheduled seminar where students will prepare for the internships, setting objectives for skills to be learned and planning effective projects, and then analyze and reflect on the work done, both in order to create greater understanding of each intern’s individual experiences and in order to think critically about how “service” and “organizing” can address the needs and goals of the disability community. Students must apply in advance for admission into this course. (F) Schweik

120. Introduction to Applied Language Studies. (3) Three hours of lecture and fieldwork per week. This course is an introduction to the study of language as applied to real world problems in specific situations. It uses the methods of language learning and teaching, language socialization, bilingualism and multilingualism, language policy and planning, computer-mediated communication, stylistics, intercultural communication, language and symbolic power, political and commercial rhetoric. Fieldwork consists of observation and analysis of language-related real world problems. (F) Kramsch

C133. Death, Dying, and Modern Medicine: Historical and Contemporary Perspectives. (4) Three hours of lecture per week. This course will study the end of life—dying and death—from the perspective of medicine and history. It seeks to confront the humanist with the quotidian dimensions of biomedical practice and to find deep engagement with death more generally. It invites pre-med, pre-law, and public policy students to understand these matters in light of the historical and, more broadly, the artistic perspectives of the humanities. Also listed as History C119 and Health and Medical Sciences C133. (SP) Laqueur; Micco

C135. Visual Autobiography. (4) Six hours of lecture per week. Prerequisites: Consent of instructor. Since visual and literary studies have historically been viewed as separate disciplines, we will work from both to study those forms of self-representation that defy disciplinary boundaries, or what we call “visual autobiography.” The course aims to help students understand the relationship of the elements of visual literacy (reading and writing) and visual literacy (observing and making) in order to develop a third distinctive textual/visual literacy. Also listed as Visual Studies C185A, American Studies C174, and English C143V. This course satisfies the American Cultures requirement.

C136. The American Forest: Its Ecology, History, and Representation. (4) Three hours of lecture and one hour of discussion per week. The American forest will be examined in terms of its ecology, history, and cultural representation. (F)

C153. Judaism in Late Antiquity. (3) Three hours of lecture and one hour of discussion per week. This course will study the end of life—dying and death—from the perspective of medicine and history. It seeks to confront the humanist with the quotidian dimensions of biomedical practice and to find deep engagement with death more generally. It invites pre-med, pre-law, and public policy students to understand these matters in light of the historical and, more broadly, the artistic perspectives of the humanities. Also listed as History C119 and Health and Medical Sciences C133. (SP) Laqueur; Micco

C155. Jewish Civilization: Modern Period. (4) Three hours of lecture and one hour of discussion per week. This is the fourth course in a four-course sequence in the history of Jewish culture and civilization. It explores the major themes in Jewish history from 1750 to the present, with special attention paid to the transformation of Jewish communal and individual identity in the modern world. Topics to be treated include the breakdown of traditional society, enlightenment and modernization, Zionism, and contemporary Jewish life in Europe, North America, and Israel. The multicultural nature of Jewish history will be highlighted through the study of those individuals who broke with the normal patterns of non-European Jewish narratives alongside the more familiar Ashkenazi perspective. Also listed as History C175B and Religious Studies C135. (SP)

160. Art. Four hours of lecture per week. This course will explore the development of modern arts in America, including the role that women have played. It will be taught through the analysis of works of art, as well as through written discussion and critical essays. Fieldwork consists of observation and analysis in museums such as the Smithsonian or performance venues such as theatres; art history and public issues involving arts sponsorship and presentation. (F,SP)

161. International Non-Governmental Organizations. (4) Four hours of lecture per week. This course will study the emergence and development of international organizations since World War II. It will examine core issues, including the role of NGOs in the global political economy, the changing role of the United States and other leading states, and the impact of NGOs on decision-making processes. (F)

162. Political Science. Four hours of lecture per week. This course explores issues in political science including legislative and executive processes, voting behavior, public opinion, mass media, elections, parties, and the international dynamics involved in the formulation of U.S. policy. (SP) Miller

162C. Campaign Effects and Management. (4) What does political science research tell us about how to manage a political campaign? We’ll begin by discussing the magnitude of effects campaigns have in the face of prevailing forces such as partisanship and economic health. We’ll also examine the experiments that test get-out-the-vote techniques and examine the use of technology in motivating voters. Finally, we’ll analyze partisan biases and think about how voters can be persuaded. Part of this course is quantitative in nature, and students should feel comfortable reading about and working with political data. (SP) Strauss

162D. Manias, Panics and Crashes: The Politics of Financial Crises. (4) This course is designed to help students explore the political dimensions of financial crises. It will focus on major financial crises such as the Global Financial Crisis and the current European debt crisis. The course will be taught through the analysis of works of art, as well as through written discussion and critical essays. Fieldwork consists of observation and analysis in museums such as the Smithsonian or performance venues such as theatres; art history and public issues involving arts sponsorship and presentation. (F,SP)

162E. Environmental Policymaking and the Politics of Climate Change. (4) World leaders at the United Nations Framework Convention on Climate Change (UNFCCC) held in Copenhagen this past December announced that they reached “a meaningful agreement” that will lead to a global treaty to address climate change. Many observers see the politics of the Copenhagen Accord as a glimpse into the new world order in which international diplomatic power will increasingly be shared by the United States and emerging powers, such as China. Climate change policy also offers a lens through which the U.S. domestic environmental policymaking process can be viewed and its evolution understood in the context of the changing global financial elites, and the dynamic system of rules, norms, markets, and organizations that constitute the political environment of international finance. We will explore the current global climate change negotiations from a comparative and historical perspective. Our inquiry will include an intellectual dialogue with the work of theorists, market participants, and policymakers. How can we prevent another financial catastrophe? What should we do about banks that are “too big to fail”? Will I be able to find a job when I graduate? What can the IMF do to help developing countries cope? How will U.S.-China diplomatic relations be impacted? Is U.S. financial hegemony slowly relegating itself to the dustbin of history? Is the current policy response adequate or are we merely creating another bubble? The Global Financial Crisis is on everyone’s minds. (SP) Tubin

162F. The Politics of Foreign Policy: From John F. Kennedy to Barack Obama. (4) The course will look at American foreign policy from John F. Kennedy in the 1960s to Barack Obama in the 2010s. We will analyze the major foreign policy issues from the Cuban Missile Crisis to Vietnam to the two wars in Iraq to the war in Afghanistan and the ongoing war on terrorism. We will discuss the role of domestic politics in shaping U.S. policy, and the international dynamics involved in the formulation of U.S. policy. (SP) Miller

prefix=language course for business majors
prefix=course satisfies R&CC requirement
prefix=course satisfies American Cultures requirement
prefix=online course
prefix=Professor of the Graduate School
prefix=Recipient of Distinguished Teaching Award
The course will look at the role of the president, Congress, and interest groups in determining foreign policy. (F) Gutman

162H. Interest Group Politics: Lobbying and Influences. (4) This course will explore the role of interest groups and lobbyists in the American political process. We will discuss what makes an influential lobbyist in Washington. We will examine the ways in which organized interests try to achieve their goals, and what mechanisms or processes make them successful. We will investigate whether the tens of thousands of lobbyists roaming the streets of Washington improve or detract from the quality of American democracy. (SP) Roth

163. A Theatre of Meaning in the Digital Age. (3) Three hours of lecture per week. This course will center on the high-minded aspirations (and continuing challenges) of the resident theater companies who program contemporary, politically-engaged, theatrical fare. We will explore different definitions of what makes a piece political, and we will also ask why the theater is compelled to try and be political in a town where politicians and lobbyists and interest groups work on politics in such a microscopic detail every day. In particular, we will focus on the wide range of material presently being offered by Washington's leading theater companies. Part theater appreciation course—with an emphasis on plays in performance and part theater practicum with a thrust towards reading and evaluating new scripts submitted to Theater J—the host theater for this course—we will use our field trips and our readings and even a brand new work to make written recommendations as to what Theater J (as well as our own newly conceived “pretend” theater companies) should produce next season. (F) Roth

164. The Power of Display: Museum Exhibitions and the Politics of Interpretation. (3) Three hours of lecture per week. This course explores museums as dynamic sites of intellectual and cultural debate. Now more than ever, as the process of globaliztion raises questions about the fluidity, preservation, and “authenticity” of culture, museums of all kinds are attracting great interest both as places to visit and as a subject of critical analysis in their own right. As places defined by the collection, display, and interpretation of objects, museums are bound up in questions of permanence and transience, difference and identity, equity and privilege—issues shaping both popular and scholarly discourse on the politics of culture today. Historically, museums have been vested with the authority to construct particular ways of knowing and the world. How, why, and to what ends? Focusing on the exhibition as its interpretive practice, this course will investigate the role of museological interpretation in the interpretation of culture. It is open to students who have not had previous experience in museum studies. (SP) Moussavi

165. A Window into How Washington Works. (4) Three hours of lecture per week. The federal government affects policies (e.g., enhancing public safety, protecting the environment) in many ways: legislation, expenditure, spending, and regulating. This course will explore how regulations—important instruments of government and the easiest of one’s way to be President to make his/her mark—are drafted, reviewed, never repealed. With an emphasis on how the various institutions of the federal government are involved in the process and how they interact with the other interested entities. (SP) Katzen

166. The New World Order and Its Critics. (3) Three hours of lecture per week. Since the end of the Cold War, the phrase “new world order” has become ubiquitous. For some, this phrase points to the U.S.’s dominant role as the most powerful state in the international arena and an opportunity and obligation to establish a new Pax Americana. For others, the driving force is more spontaneous, linked to the much broader process of globalization, featuring transnational corporations, people, and lifestyles in an increasingly “borderless” world. For still others, it is the emergence of meaningful forms of governance beyond the nation-state. On the other hand, some scholars and actors see very little that is actually new or different in post-Cold War order as simply the most recent iteration of traditional realpolitik, or merely the latest attempt of the West to impose its values, economic interests, and political systems on others without the diversity of cultures worldwide or the economic vulnerability of poorer regions. This seminar aims to understand the theoretical assumptions and historically interpretations that lie at the heart of these understandings of the post-Cold War world. (SP) Doherty

167. Environmental Regulation and Policy. (3) Three hours of lecture per week. This course provides an introduction to some of the leading issues and themes in the development of modern environmental regulation in the United States. With the help of Richard Lazarus’ survey, The Making of Environmental Law (2004), we will trace the creation and elaboration of the regulatory regime that has governed the use of American air, water, land, and wildlife resources since 1970. We will then look back to some of the classic expressions of the conservation ethic in America in the writings of John Muir, Rachel Carson, and others. We will examine certain ongoing challenges to the achievement of environmental protection goals, including in the area of climate change, and the tensions with economic and other societal imperatives inherent in attempts to respond to these challenges. The final class session(s) will be devoted to student presentations of research essay theses. (F) Sither

168. Congressional Elections. (3) Three hours of lecture per week. This seminar focuses on congressional campaigns, drawing examples from current elections. Congressional campaigns will be examined from several perspectives, including those of candidates, party officials, and interest group leaders. The class will explore the backgrounds of congressional candidates, the decision to run for office, campaign organizations, campaign finance, strategy, communications, the roles of parties and interest groups, and related topics. Students will be required to research and present expertise available in the Washington area. Party officials and political consultants who work in congressional elections will brief the class. Students are advised that they may need to adjust their schedules to attend the briefings. (F) Herman

169. American Foreign Policy. (3) Three hours of seminar per week. This seminar is dedicated to developing critical reading and writing skills in the areas of international relations and contemporary (comparative and regional) foreign policy. This course is designed to help students understand the nature, purpose, and future of U.S. hegemony or global dominance. This is the issue, arguably, at the core of debate today about American foreign policy. (SP) Vitalis

171. The Middle East Conflict in Living Color and the American Civil War on Stage. (3) Three hours of lecture per week. Over the past four years, this course has canvassed the Washington theater scene and discovered a wealth of politically and socially attuned material on D.C. stages. Washington has, rather than being a provincial backwater, been the second most vibrant theatrical city in the nation, surpassing Chicago and Los Angeles in number of performances offered, audience in attendance, and union actors appearing in Equity-productions of some of the finest classical, flagship, and culturally specific theaters in the country. This advent of a robust theater scene planted at the seat of power has created a rich environment for those able to speak truth to power. Yet, often times, theatrical institutions are constricted by the divided nature of the audience they play for, the critical community that criticizes them, or differing notions about the purpose of theater. What kind of ports are emerging from area theaters in this politicized capital? What are the practical politics within these institutions that seek to engage and entertain their patrons? (SP) Rozer

172. Islam and Democracy in the Modern Age. (3) Three hours of lecture per week. This course will primarily undertake to explore democratic notions in Islamic tradition that could provide a legal base for political legitimacy but that either have not been institutionalized or are part of a dead letter of history. The course then studies Muslim societies in modern times to find out how these Islamic democratic notions have been influenced by modern circuits and incorporation into public legal systems. It then turns to the pluralistic interpretations of Islam that have, since the beginning of the 20th century, tried to adapt democratic institutions to Islamic values. Closely related to this issue, it studies the new round of hermeneutical readings of the religious texts, which emerged beginning in the 1980s, some of which propose a minimal role for the apparent meanings of the texts. Finally, the course will survey challenges to the above-mentioned recent trends brought by traditional thinkers for whom the free interpretation of the religious texts would weaken the faith and add to the present confusion in understanding Islam. (SP) Moussavi

173. Museums and Society: The Power of Display in Washington, D.C. (3) Three hours of lecture per week. This course explores museums as dynamic sites of intellectual and cultural debate, and as institutions associated with the authority to define aesthetics, history, heritage, and even citizenship. Now, more than ever, as the process of globalization raises questions about the fluidity, preservation, and “authenticity” of culture, museums of all kinds are attracting great interest both as places to visit and as a subject of critical analysis in their own right. As places defined by the collection, display, and interpretation of objects, museums are bound up in questions of permanence and transience, difference and identity, equity and privilege—issues that lie at the heart of what is termed the “new museology.” But as institutional repositories of community memory or indigenous knowledge, they are also bound up in questions of representation, access and ownership—issues that move the debate over museum collections squarely into the politics of local state, and national control over heritage. If ownership and control are the new realities of international heritage policy (and law), museums have quickly emerged as important sites on which and through which these claims are being made. (SP) Reddy

174. Religion and Politics in the United States. (3) This course will explore the question of what it means to say that there should be a “wall of separation” between religion and the state in order to protect each. Nonetheless, throughout U.S. history, religion, politics have been bound up in questions of permanence and transience, difference and identity, equity and privilege—issues that lie at the heart of what is termed the “new museology.” But as institutional repositories of community memory or indigenous knowledge, they are also bound up in questions of representation, access and ownership—issues that move the debate over museum collections squarely into the politics of local state, and national control over heritage. If ownership and control are the new realities of international heritage policy (and law), museums have quickly emerged as important sites on which and through which these claims are being made. (SP) Reddy

187. Project-Based Instruction. (4) Two hours of lecture, one hour of discussion, and three hours of field work per week. Focusing on sustainability, the course engages students from different math, science, and engineering majors in the process of applying the content knowledge from their discipline to projects that build or construct new objects requiring representation as part of a 45-hour field placement in a local high school classroom. Students develop pedagogical content knowledge and relate teaching theory to producing rigorous readings, classroom activities, discussion, lesson planning, and field observations. (F) Johnson
182. Supervised Research. Course may be repeated for credit. Students may enroll in only one section of 192 per semester. Requires three hours of work per week per unit. Must be taken on a passed/not passed basis. Undergraduate Research Apprenticeship Program (URAP). Directed individual research on topics connected to faculty scholarship. (F, SP)

192A. Humanities. (1-4)

192B. Social Sciences. (1-4)

192C. Biological Sciences. (1-4)

192D. Physical Sciences. (1-4)

192E. Interdisciplinary Studies. (1-4)

C196W. Special Field Research. (10.5) Course may be repeated for a maximum of 12 units. 240-300 hours of work per semester plus regular meetings with the faculty supervisor. Students work in selected internship programs approved in advance by the faculty coordinator and for which written contracts have been established between the sponsoring organization and the student. Students will be expected to produce two progress reports for their faculty coordinator during the course of the internship, as well as a final paper for the course consisting of at least 35 pages. Other restrictions apply; see faculty adviser. Also listed as American Cultures.

198. Directed Group Study for Upper Division Students. (1-4) Course may be repeated for credit as topic varies. Must be taken on a passed/not passed basis. Seminars for group study of topics not covered by regularly scheduled courses. Topics may vary from semester to semester. Students must have completed 60 units to be eligible to enroll. (F, SP)